OFGEM

Report on the Separation of the Transco LDZ Price Control

14 November 2002

Deloitte & Touche
180 Strand
London
WC2R 1BL

RE0211005/GP

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Glossary

The following abbreviations are used in this report:

ABC	Activity Based Costing
Andersen Report	Report on Transco's operating costs for the 2002/03 to 2006/07 Price Control Period, Andersen Final Report , 7 September 2001.
BPA	Base plan assumptions
BPQ	Business Plan Questionnaire, Transco's submission to OFGEM for the purposes of the price control review
CCA	Current Cost Accounting
Deloitte	Deloitte and Touche Tohmatsu
Deloitte Draft Report	Draft Report on the Separation of the Transco LDZ Price Control, Deloitte, 8 November 2002
DM	Daily Metered
EE	East England, a regional network of Transco
Final Proposals	Review of Transco's Price Control from 2002, OFGEM Final Proposals, September 2001
FTE	Full time equivalent employee
GBV	Gross Book Value
GT	Gas Transporters
HP Storage	High Pressure Storage
HR	Human Resources
Initial Consultation Document	Separation of Transco's distribution price control, Initial Consultation Document, OFGEM, July 2002.
I&C	Industrial and Commercial
Lattice	Lattice Group plc
LDZ	Local Distribution Zone
LP Storage	Low Pressure Storage
LTS	Local Transmission System
MAR	Market adjustment ratio
MNR Report	Transco Price Control Review 2002-2007, Mazars Neville Russel, September 2001
MMC	Monopolies and Mergers Commission

MMC Report	A report under the Gas Act 1986 on the restriction of prices for gas transportation and storage services, Monoplies and Mergers Commission, May 1997
NBV	Net Book Value
NDM	Non Daily Metered
N&Y	North and Yorkshire, a regional network of Transco
NL	North London, a regional network of Transco
NTS	National Transmission System
NW	North West, a regional network of Transco
OFGEM	Office of Gas and Electricity Markets
RAV	Regulatory Asset Value
RPI	Retail Price Index
S&SE	South and South East, a regional network of Transco
SC	Scotland, a regional network of Transco
SND	Seasonal normal demand
SOQ	Supply offtake quantity
Transco	Regulated gas transportation and distribution business of Transco plc
UK GAAP	United Kingdom Generally Accepted Accounting Principles
W&SW	Wales and South West, a regional network of Transco
WM	West Midlands, a regional network of Transco

1 Executive Summary

1.1 This report presents the work we have undertaken as part of OFGEM's proposals to separate the current single Local Distribution Zone "LDZ" price control into eight regional networks price controls.

1.2 In September 2001 OFGEM published its Final Proposals for Transco's price control, which took effect from 1 April 2002. The Final Proposals established a single price control to cover the operation of all 12 LDZs. During the price control review it was suggested that in the future there might be advantages in separating this LDZ price control into regional components.

1.3 From 1 April 2002 Transco has reorganised the LDZs as eight regional networks[1]. We understand that this new structure should provide better management focus on distribution activities and better information on the costs of each individual regional network. OFGEM published an Initial Consultation Document on separate price controls for each regional network in July 2002[2].

1.4 We understand that OFGEM is now working towards publishing its initial proposals on these matters in November 2002. As part of this process it will be important to publish annexes, which set out in greater detail OFGEM's approach to establishing separate price controls. This will include analysis of the allocation and attribution of the operating costs and regulatory asset value ("RAV") between the eight regional networks and in so doing will set an important reference point for subsequent price controls covering these networks.

1.5 Deloitte and Touche ("Deloitte") have been engaged by OFGEM to undertake an investigation in relation to certain elements of Transco's cost allocation process, RAV allocation process and demand forecasting methodology. Specifically, and in accordance with our engagement letter dated 23 September 2002, we have been engaged:

- to review and comment on Transco's methodology for allocating and attributing operating costs to the eight regional networks;
- to review and comment on Transco's methodology for calculating the Net Book Value ("NBV") of each LDZ and to review the subsequent attribution of the natural RAV to the eight regional networks; and
- to review and to determine the reasonableness of Transco's demand forecasts as detailed in paragraph 7.6.

1.6 The results of our work are set out in this report. Unless stated otherwise, all costs and revenues in this report are stated in real terms, in 2000 prices. We note the figures provided in the tables within this report may, at times, not cast due to rounding differences.

1 In this report the terms LDZ and regional networks are used interchangeably

2 July 2002 Separation of Transco's distribution price control – Initial Consultation Document (the "Initial Consultation Document")

The process

1.7 We have made use of information received, by OFGEM from Transco, in the course of OFGEM's preparation of the Initial Consultation Document. We have also made use of information received by OFGEM and its consultants, Mazars Neville Russell and Andersen, in the course of the 2001 price control review. This data and information includes a completed Business Plan Questionnaire[3] ("BPQ") in December 2000 and other information used by OFGEM in their initial proposals.

1.8 We have also requested further information from Transco in relation to demand forecasting, the RAV and updated information in relation to the Transaction Model.

1.9 The findings presented in this report are based on our analysis and a review of the information set out in full in Appendix 1.

Conclusions on the allocation of operating costs

1.10 Transco's methodology for allocating operating costs to the regional networks is a complex process. At the direction of OFGEM, we have concentrated our work on the attribution of costs, as reported by Transco's Activity Based Costing system, across the business units of Transco. The Transaction Model performs this attribution.

1.11 The Transaction Model represents a coherent method for modelling internal exchanges of products and services between different parts of Transco's business.

1.12 We have developed a replica model based on the same methodology, which uses the same input data as the Transaction Model. Based on our ability to replicate the results of the Transaction Model with our own model, we conclude that the allocation of operating costs presented to OFGEM by Transco is consistent with the application of the methodology of the Transaction Model described by Transco.

1.13 We have used our replica model to test the impact of alternative cost allocation scenarios. To confirm that our changes to the replica model produce valid outputs (i.e. would match the output of Transco's actual model) we have performed independent calculations outside of the replica model. Based on these referencing procedures we believe that our replica model can be used to test alternative allocation scenarios.

1.14 We have found no evidence that the allocation of operating costs is inconsistent with a reasonable expectation of cost causality. We have not identified any evidence to suggest that the costs have been allocated in a biased manner.

1.15 Overall, we believe that there are a number of Transaction Products for which alternative drivers are more appropriate and should be adopted. We believe that these changes have a small impact on the final allocation of costs. OFGEM should consider our proposed adjustments to Transco's cost allocation methodology.

3 The BPQ sets out in detail Transco's operating costs by Business Area for the period from 1997 through to 1999 together with projections to 2007

1.16 We have also considered a number of alternative drivers for common and joint costs. The alternatives proposed, may in some circumstances, be considered superior to the driver currently being used by Transco, but given the nature of the costs there is unlikely to be a single 'correct' driver. We note that Andersen's "Report on Transco's operating costs for the 2002/03 to 2006/07 Price Control Period" (the "Andersen Report"), supported this view and that Transco has acknowledged this in the past[4].

1.17 We believe that the Direct Cost method (also referred to as equi–proportional approach) is superior to alternative drivers for common and joint costs for the following reasons:

- it is consistent with prior OFGEM precedent (such as was the case with British Gas Trading);
- it avoids problems with the appropriate definition of Full Time Equivalents "FTE's" (such as whether it should include agency and industrial staff);
- it recognises that not all support costs are driven by manpower related costs (e.g. strategy related costs); and
- it recognises that multiple factors might drive costs.

1.18 We would also draw OFGEM's attention to our recommendations on Formula Rates. The figures in the Initial Consultation Document allocate Formula Rates on the basis of an initial estimate of RAV. We believe that Formula Rates should be treated separately and driven on the basis of the final 'sculpted' RAV (as determined by OFGEM).

1.19 Finally, we note that Transco is in the process of restructuring its business. Where possible we have incorporated the impact of this restructuring, by using updated driver data. We note that this may not present an accurate picture of the way costs will be allocated to the regions post-restructuring. However at present we believe our approach, by making use of the most up-to-date information available, is likely to be the best guide to the way costs may be allocated in the future.

Conclusions on RAV

1.20 Transco's methodology for allocating the total or aggregate LDZ RAV[5], across the regional networks is based on the NBV of each LDZ. The NBV was calculated from a bottom up analysis undertaken by Transco for the purpose of their BPQ response in 1999.

1.21 Based on our review of Transco's methodology for allocating the RAV, we believe that the approach is logically sound and appropriate. We have found minor computational and consistency errors in Transco's calculations. However, correcting for these two issues leads to an immaterial difference in the allocation of the RAV.

1.22 We have sought to confirm the inputs and assumptions used within Transco's bottom up approach. We have been unable to confirm the accuracy of the systems producing certain key information (e.g. unit costs). However, Transco state "the systems providing key information have previously fallen within the scope of the Regulatory and Statutory audit. Transco believe that this provides support as to the accuracy of this information"[6].

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4 Transco Initial Response to Andersen's Draft Paper Report 20 June 2001, p 5

5 Of £9,376m as set out in the Initial Consultation Document

6 Transco response to Deloitte's Draft Report 8 November 2002

1.23 We have also undertaken a sensitivity analysis in order to understand the impact on the allocation of the RAV from using alternative inputs and assumptions, for example unit costs or asset lives. Under reasonable scenarios we do not consider the allocation of RAV to be particularly sensitive to changes in key inputs and assumptions.

1.24 It is of course important to put this allocation into context. OFGEM indicates in its Initial Consultation Document, that the initial estimate of RAV for each LDZ may need to be adjusted or sculpted to eliminate any initial regional variations in consumer gas prices. In this context, the allocation of the RAV using this methodology appears less important.

Conclusions on demand forecasting

1.25 We understand that OFGEM has previously gained assurance on the overall demand forecasting methodology. The purpose of this review is to ensure that the overall methodology has been applied appropriately at an individual regional network level. Therefore, this assessment is based on our understanding of the demand forecasting process and also on the findings of other third parties who have previously reviewed the demand forecasting process.

1.26 We note that the demand forecasting process is a bottom-up approach based on planning assumptions and input data sourced on an individual LDZ basis, where appropriate. This produces demand forecasts at a disaggregated LDZ level. The economic assumptions and market intelligence used are sourced from reputable specialists and the process involves validation through public consultation and extensive internal review.

1.27 Overall Transco's LDZ demand forecasting process is based on a sound approach and appears to be comprehensive. However, we have not reviewed in detail the specification of the demand forecasting models or performed any checks on the data used in the models.

1.28 Common with any forecasting process, Transco's process, whilst appearing comprehensive and utilising sound techniques will inevitably be subject to forecast inaccuracies. Based on our discussions with OFGEM these inaccuracies appear to fall within a tolerable range.

1.29 To test the impact of forecasting inaccuracies we performed sensitivity analysis. The initial split of allowed revenue in 2002/03 is impacted by demand forecast inaccuracies. OFGEM should consider whether they believe this change to be material.

2 Introduction and Scope of Work

Introduction

2.1 This report presents the work we have undertaken as part of OFGEM's proposals to separate the current single LDZ price control into eight regional networks' price controls.

2.2 In September 2001 OFGEM published its Final Proposals for Transco's price control, which took effect from 1 April 2002. The Final Proposals established a single price control to cover the operation of all 12 LDZs. During the price control review it was suggested that in the future there might be advantages in separating this LDZ price control into regional components.

2.3 From 1 April 2002 Transco has reorganised the LDZs as eight regional networks. We understand that this new structure should provide better management focus on distribution activities and better information on the costs of each individual regional network. OFGEM published an Initial Consultation Document on separate price controls for each regional network in July 2002.

2.4 We understand that OFGEM is now working towards publishing its initial proposals on these matters in November 2002. As part of this process it will be important to publish annexes, which set out in greater detail OFGEM's approach to establishing separate price controls. This will include analysis of the allocation and attribution of operating costs and RAV between the eight regional networks and in so doing will set an important reference point for subsequent price controls covering these networks.

2.5 The overall objectives of this engagement can be summarised as follows:

- allocation of operating costs: to review and comment on Transco's methodology for allocating and attributing operating costs to the eight regional networks;
- allocation of RAV: to review and comment on Transco's methodology for calculating the NBV of each LDZ and to review the subsequent attribution of the RAV to the eight regional networks; and
- distribution charge revenue**:** to review Transco's LDZ demand forecasting methodology in order to assist OFGEM in assessing the reasonableness and accuracy of the demand forecasts provided by Transco. Demand forecasts are a key input into the determination of regional network revenues and into Transco's regional charges. We understand that OFGEM has relied on Transco's proposed regional network revenue split, which is based on the May 2001 LDZ demand forecast, to project regional revenues in their Initial Consultation Document which is used to determine the sculpted RAV for individual LDZs.

2.6 In this section we set out:

- our terms of reference and scope of work;
- limitations on the scope of our work;
- a high-level overview of our approach;
- the information we have relied upon to perform our work; and
- a summary of the structure of this report.

Terms of reference and scope of work

2.7 The proposed separation of the LDZ price control will include an allowance for the projected operating cost of each LDZs, and a return on the projected sculpted RAV of each LDZ. Accordingly, Deloitte have been engaged by OFGEM to undertake an investigation in relation to certain elements of Transco's cost allocation process, RAV attribution methodology and demand forecasting methodology.

2.8 In relation to the cost allocation process, we were engaged to:

- reconcile the total operating costs produced by Transco's latest Transaction Model to Transco's regulatory accounts in 2000;
- replicate the Transaction Model to determine whether the operating cost attribution methodology applied by the Transaction Model is working as described by Transco;
- review the methodology for allocating direct and indirect costs and assess the appropriateness of the cost drivers and allocation rules being used in the Transaction Model;
- quantify alternative drivers and test the sensitivity of the allocation of operating costs to the regional networks as a result of using alternative cost drivers; and
- assess whether the overall estimate of costs allocated to each networks appears to be reasonable.

2.9 In relation to the allocation of RAV, we have been engaged to:

- review the methodology for allocating assets and for determining the RAV for each LDZ;
- discuss the reasonableness of the approach jointly with Transco and OFGEM's technical experts;
- ensure that Transco's methodology is consistent with the approach adopted by the Monopolies and Mergers Commission ("MMC") in their May 1997 report on the restriction of prices for gas transportation (the 'MMC report')
- perform an independent roll forward of assets with appropriate age profile assumptions to ensure the accuracy and sensitivity of Transco's calculations; and
- assess whether the overall estimate of NBV for each LDZ appears to be reasonable and reconcile these to the LDZ RAV in the Final Proposals.

2.10 In relation to Transco's demand forecasting methodology, we have been engaged to:

- reviewed Transco's methodology for forecasting regional network demand (including assumptions on peak flow);
- reconciled forecasts to Transco's Ten Year Statement and perform trend analysis to test the accuracy of previous forecasts; and
- reviewed relevant third party reports on the demand forecasting methodology.

2.11 Our work and conclusions have been based on:

- a review of available information (e.g. the BPQ and supplemental questions and responses made during Transco's price control review, together with additional information sent to support Transco's network price control);

- a review of work performed on the Transaction Model during Transco's Price Control;
- a review of material supplied by Transco to OFGEM prior to September 2002 on which many figures in the Initial Consultation Document were based;
- a request for further information to justify Transco's approach. We developed additional questions for Transco, which were provided on 2 October, 21 October, 22 October and 24 October 2002;
- a review of Transco's written responses;
- a formal meeting with Transco to discuss cost allocation and demand forecasting methodologies on 16 October 2002;
- numerous telephone conversations with Transco personnel over the period 17 October 2002 to 4 November 2002; and
- analysis performed by us which is set out in this report.

Limitations to our work

2.12 We have checked the internal consistency of data supplied to us by Transco. However, nothing in this report should be taken to imply that we have conducted any procedures or investigations in an attempt to verify or confirm, by means of reviewing source documentation or processes, the accuracy of the data underlying information. Our work does not constitute an audit.

2.13 Transco's Transaction Model is complex and large, reflecting the complex nature of its business and the large number of activities that drive costs (according to Transco, over 1000). We have constructed a replica model which is high level and does not operate at the same level of detail as the Transaction Model. In creating our own model we note that we have not had direct access to an electronic copy of Transco's Transaction Model. Our model is based on electronic files provided by Transco, which provide details of all the allocation rules and cost drivers used within Transco's model. Validation of Transco's model, using our model, has therefore been restricted to comparing the results in the output files provided by Transco with the results from our model.

2.14 With respect to cost allocation, our work has been limited to evaluating and analysing the operating cost allocation methodologies, at a Transaction Product level only. Transaction Products have been derived from Planning and Activity Based Costing ("ABC") Products, which have been created by a detailed ABC exercise. We have not been required to review the ABC exercise or the derivation of Transaction Products. In addition, we note that the scope of our work has not included a review of the integrity of Transco's data inputs.

2.15 Transco has an asset register by individual LDZ. This register has then been rolled forward to determine the RAV for each LDZ. We understand that there is no requirement to "audit" or form an opinion on the accuracy of the initial asset register. It is assumed that this has been audited and verified by Transco's own auditors.

2.16 This report has been written solely for the use of OFGEM. OFGEM are aware of the limitations of our work as set out in this report and in our engagement letter dated 23 September 2002. We are aware that OFGEM will rely in part on our findings, as set out in this report, in its proposal of the separation of the LDZ price control. We are also aware that this report will be provided to Transco prior to publication as part of the process of the proposal and will be made publicly available by OFGEM. However, no third party may rely on our findings.

Approach overview

2.17 Our adopted approach for each aspect of work is summarised at a high-level below.

Transco's cost allocation methodology

2.18 Our work in relation to Transco's cost allocation methodology is set out in Sections 3 to 5 of this report.

2.19 In reviewing the cost allocation model used by Transco to allocate operating costs to regional networks we have used data from Transco to create a replica model. We have used our replica model to consider whether Transco's model allocates operating costs as described by Transco.

2.20 We have also reviewed the cost allocation rules within the model to determine whether they are appropriate and have tested the sensitivity of the allocation of costs to the LDZs[7] to changes in cost drivers. In doing so, we have considered the allocation methodologies with respect to common and joint costs.

Transco's RAV attribution methodology

2.21 Our work in relation to Transco's RAV attribution methodology is set out in Section 6 of this report.

2.22 We have gained a detailed understanding of Transco's methodology, which has been confirmed by Transco. We have re-performed Transco's calculations in deriving the NBV for the four key asset categories and for the allocation of the Total RAV across the LDZs for all asset categories. We have considered alternative methods for allocating the RAV.

2.23 We have tried to validate the inputs and assumptions used within Transco's calculations. Where insufficient support has been received, we have undertaken sensitivity analysis to assess the impact of different assumptions.

2.24 We have reconciled Transco's calculations to the allowable, aggregate LDZ RAV total as set out in Transco's 2001 price control.

Transco's demand forecasting methodology

2.25 Our work in relation to Transco's demand forecasting methodology is set out in Section 7 of this report.

2.26 We have reviewed and gained an understanding of Transco's demand forecasting methodology. This understanding is based on meetings held with Transco and a review of findings of other third parties who have previously reviewed the demand forecasting process.

2.27 We have analysed information on LDZ forecasting accuracy, and have presented analysis considering the impact of the accuracy of forecasts on projected regional network revenues.

Information relied upon

2.28 The findings presented in this report are based on our review and consideration of, *inter alia*, the information set out in Appendix 1.

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7 The Transaction Model allocates costs to the 12 LDZs. These are then combined, in a simple process outside the model, to present costs for the eight regional networks

Structure of this report

2.29 We set out our review of Transco's cost allocation process:

- in Section 3 where we present our understanding of Transco's cost allocation methodology;
- in Section 4 where we review whether the Transaction Model is operating as described by Transco; and
- in Section 5 where we provide assessment of the cost allocation drivers used in the Transaction Model.

2.30 We set out our review of Transco's RAV attribution methodology in Section 6 and Transco's demand forecasting methodology in Section 7.

3 Review of Operating Cost Allocation Methodology

Introduction

3.1 We have been engaged by OFGEM to review and comment on Transco's methodology for allocating and attributing operating costs to the eight regional networks[8]. Specifically, we have been engaged by OFGEM to:

- reconcile the total operating costs produced by Transco's latest Transaction Model to Transco's regulatory accounts in 2000;
- replicate as far as practicable the Transaction Model to determine whether the operating cost attribution methodology applied by the Transaction Model is working as described by Transco;
- review the methodology for allocating direct and indirect costs and assess the appropriateness of the cost drivers and allocation rules being used in the Transaction Model;
- quantify alternative drivers and test the sensitivity of the allocation of operating costs to the regional networks as a result of using alternative cost drivers; and
- assess whether the overall estimate of costs allocated to each region appears reasonable.

3.2 OFGEM has requested us to focus our review on the allocation of costs for the year ending 31 December 2000. We understand that OFGEM intends to use the proportions derived by this analysis to allocate the LDZ price controlled operating cost allowance to the regional networks. This approach is consistent to the approach adopted by OFGEM in its Initial Consultation Document.

3.3 We understand, however, that Transco has undertaken significant restructuring since 2000. This restructuring could change the appropriate allocation of costs between LDZs and, as a result, it may not be reasonable to use the 2000 proportions to allocate allowable operating costs throughout the price control period.

3.4 We understand that most of Transco's restructuring occurred during the year 2002. We have sought to understand the impact of restructuring based on the latest data available (i.e. actual data for the five months ended 31 August 2002). We outline the changes to the organisation, and the resulting changes to the Transaction Model in Section 4. In light of these changes we comment in paragraphs 5.21 to 5.28 on the relevance in 2000 of changes made to the Transaction Model since 2000.

3.5 In this section, we provide a high level summary of the methodology adopted by Transco to allocate operating costs. The methodology is embedded within Transco's Transaction Model that has been developed to attribute costs across different business units within their organisation. In addition, we provide a summary of how Transco's broader ABC costing methodology may impact that allocation of costs to LDZs.

3.6 In Section 4, we document the work we have performed to assess whether the Transaction Model is functioning as described by Transco and in Section 5 we set out the work we have performed to ensure the cost drivers used to allocate costs are appropriate.

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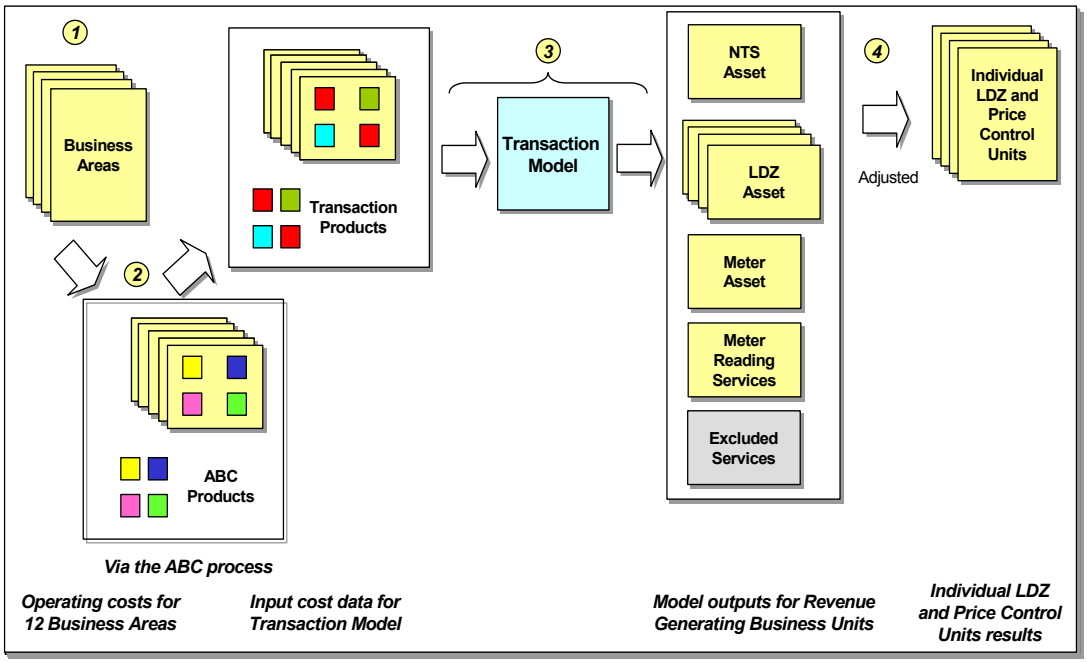
8 Prior to restructuring in 2002 the eight regional networks were organised as 12 LDZs

Overview of Transco's cost allocation methodology in 2000 and 2002

3.7 The cost allocation methodology adopted by Transco is complex.

3.8 Figure 3-1 summarises the processes by which the operating costs reported in Transco's Business Areas are reallocated to the individual LDZs[9] and the other Price Control Units.

Figure 3-1: Summary of cost allocation methodology[10]



3.9 The cost allocation methodology can be summarised in four steps[11].

- **Step 1:** Transco is organised into "Business Areas". Operating costs are reported in each of the Business Areas. Transco monitors the levels of costs being incurred in relation to each activity within each Business Area. Accordingly, operating costs within each Business Area have been allocated to these Business Area activities ("Planning Products" and "ABC Products") by means of an ABC exercise.

- **Step 2:** Given the large number of Planning and ABC products (over 1000), Transco has aggregated some ABC products into "higher-level" products ("Transaction Products"), of which there are over 500, to simplify the reallocation process. The Transaction Products broadly reflect products/services that are either consumed internally by different areas of Transco's business or provided externally to Transco's customers.

9 The Transaction Model in both 2000 and 2002 allocates costs to the 12 LDZs. These are then combined, in a simple process outside the model, to present costs for the eight regional networks

10 Source: Deloitte. We note that in 2002 the Transaction model also has a separate systems operator output This has not been shown in the figure above.

11 A comprehensive summary of the cost allocation methodology can be found in Transco's document entitled "A Guide to the Transaction Model", dated October 2000. The methodology is also discussed in the Andersen report

- **Step 3:** The Transaction Model applies allocation rules to allocate Transaction Products to the four main Revenue Generating Business Units, NTS Asset, LDZ Asset (individually for the 12 LDZs)[9], Meter Asset and Meter Reading Services[12], and to an Excluded Services Transaction Product[13]. This is a complex process and the Transaction Model iterates a number of times until all the costs are reallocated in accordance with the allocation rules.

- **Step 4:** The results from the Transaction Model (operating cost allocations to the four main Revenue Generating Business Units and to the Excluded Services product) need further adjustment in order to derive allowable costs for Price Control Units. These adjustments are minor and reflect costs associated with unregulated activities[14]. The adjusted operating costs remaining in each Revenue Generating Business Unit correspond to the final controllable operating costs allocated to the four Price Control Units.

Review of the Activity Based Costing System

3.10 As noted above, Transaction Products have been derived from Planning and ABC products, which have ultimately been derived through a detailed ABC exercise. At this stage, at the request of OFGEM, we have not performed a detailed review of Transco's ABC exercise.

3.11 It is possible that weaknesses in the ABC methodology could bias the allocation of costs to LDZs. At a high level, therefore, we have sought to understand if this is a material issue.

3.12 We understand that KPMG conducted a comprehensive review of the ABC system in 1999 and that they made several recommendations to improve the system. The report identifies methodological weaknesses in relation to the LDZs: *"Methodology weaknesses were identified that in our opinion mean there are likely to be material errors in the costs of some large LDZ activities and in four LDZ products".*

3.13 In Appendix 5 of the Andersen report it was noted in paragraph 5.5 that *"Transco have confirmed that these methodological weaknesses impact only on the cost allocation between LDZs and do not impact on the results from the Transaction Model at an aggregated level"*.

3.14 In response to the KPMG report, we understand that Transco has reviewed KPMG's recommendations and implemented those they deemed appropriate (this process is recorded in Transco's "Action Plan"). In addition, we understand that Lattice's Corporate Audit group conducted a status review in 2000 to report on the implementation of KPMG's recommendations.

12 From 2001 onwards Meter Reading Services and Meter Asset have been combined into the single Revenue Generating Business Unit of Metering

13 Excluded services are costs associated with unregulated activities (de-minimis activities) and are excluded from the price control

14 There are some costs associated with unregulated activities that are allocated to the NTS Asset Revenue Generating Business Unit. These costs are identified separately in the Transaction Product, External De-Minimis work. This product is excluded for price control purposes

3.15 In the course of our work we have had access to the KPMG summary report and to the Action Plan. We have requested, but have not had access to, a copy of the full KPMG report and to the Lattice Corporate Audit Report. However, Transco confirmed to us in our meeting of 16 October 2002, that as at that date they have now implemented all steps on their Action Plan. They also confirmed in that meeting that Lattice Corporate Audit only reported one outstanding item, which Transco has subsequently resolved.

3.16 We have also discussed, with Transco, the allocation weaknesses identified by KPMG. Transco state the "methodological weaknesses reported in the KPMG report relate to [the] allocation of costs to products within an LDZ not between LDZs and do not therefore impact on the Transaction model"[15].

3.17 On this basis, we believe that the risk of misstatement as a consequence of remaining weaknesses in the ABC methodology are likely to be small.

15 Transco response to Deloitte Draft Report, 8 November 2002

4 The Transaction Model

Introduction

4.1 As indicated in the previous section, Transco's methodology for allocating operating costs is embedded within the Transaction Model. In this section, we summarise our approach to testing whether the allocation of operating costs by means of the Transaction Model is as described by Transco.

4.2 In this section, therefore, we:

- perform a reconciliation of total operating costs produced by the Transaction Model to Transco's regulatory accounts in 2000, to ensure that the correct level of costs is being allocated within the model;
- summarise at a high-level how the Transaction model has changed between 2000 and 2002;
- summarise our approach to testing the Transaction Model in both 2000 and 2002; and
- provide the results of our review and conclusions.

Reconciliation of 2000 Regulatory Accounts and Transaction Model Output

4.3 We confirm that the amounts for operating costs, replacement expenditure and depreciation reported by Transco in their Regulatory Accounting Statements[16] reconcile to the level of costs contained within the Transaction Model. The network code liability reconciles to that reported in the Andersen report[17].

4.4 A reconciliation is provided in the table below:

16 See pages 9 and 19 of Transco's 2000 Regulatory Accounting Statements

17 See paragraph 6.23 of the Andersen report

Table 4-1: Reconciliation of total operating costs (£'m 2000 prices)[18]

Transco's Regulatory Accounting Statement 2000	
Total operating costs	1,999
Less replacement expenditure	(249)
Less depreciation	(450)
Less network code liability	(50)
Transportation operating costs	**1,250**
Transaction Model Total	
Total operating costs	1,257
sundry adjustments	1.5
Less de minimis costs	(8.5)
Transportation operating costs	**1,250**

4.5 The adjusting items to the Transaction Model reflect de minimis costs, which lie outside the price control, and sundry adjustments. Transco state the de minimis amount "represents the net of £1m de minimis costs added back (as a larger figure was subsequently removed) and £0.5m spread from costs which were not attributed to any Transaction model products"[19].

4.6 Given the relative immateriality of this cost, however, we would conclude that the Transaction Model does reconcile to the Regulatory Accounts in 2000.

The impact of restructuring on the Transaction Model

4.7 In 2000, Transco was organised into 12 Business Areas (assuming the 12 LDZs are treated as one aggregated Business Area). These Business Areas comprise NTS, LDZ Operations, LDZ Asset, Shipper Services, Information Systems, Transco HQ, Central Items, Connections, Support Services, System Operations, Scotland Asset and Pipeline Maintenance Contract.

4.8 We understand that since 2000 Transco has implemented several organisational changes, including:

- the reorganisation of the LDZ Operations element of Transco in September 2001 into three businesses: Repair and Replace, Design, Build and Maintain, and Emergency Services; and
- a general company restructure in Spring 2002, where certain functions moved between Business Areas.

18 Source: see paragraphs 4.3 and 4.5

19 Transco response to the Deloitte Draft Report, 8 November 2002

4.9 As a result Transco was organised into nine Business Areas during the period to 31 August 2002. These nine areas comprise National Operations (including Design, Build and Maintain, and Emergency Services), National Transmission and Trading, Metering, Chief Operating Officer, Finance, Human Resources, General Counsel, Safety and Engineering and Information Systems. The eight regional networks and LDZ Repair and Replace form a sub-division within the Chief Operating Officer Business Area. These changes are incorporated into the Transaction Model covering the five-month period ending 31 August 2002.

4.10 In testing the allocation methodology we have tested both versions of the Transaction Model (i.e. in 2000 and in 2002).

Our approach to testing the Transaction Model

4.11 Using information provided by Transco[20], we have developed a high level replica of the Transaction Model[21] for the 12 months ended December 2000, and the five months ended August 2002[22]. In creating our own model we have not had direct access to an electronic copy of Transco's Transaction Model. Our model is based on certain electronic files provided by Transco, which detail the allocation rules and cost drivers used in the Transaction Model.

4.12 In our replica model we use the allocation rules provided by Transco to reallocate operating costs to the individual LDZ's. We have then validated Transco's model by comparing Transco's output files with the results from our models.

4.13 We note that our replica model differs from the replica built by Andersen during the Transco Price Control. For example, the latest replica model:

- is based on actual data rather than forecast;
- uses three layers of rules to allocate costs (previously only two were used); and
- in the five months ended August 2002 it reflects the impact of restructuring on the business.

Replica Transaction Model Outputs

4.14 Table 4-2 below provides a comparison of operating costs allocated to the regional networks for the year ending 31 December 2000.

20 Transco has provided details of the allocation rules used in the Transaction Model, input data and output data

21 Our model was developed in Microsoft Access

22 Following a change in accounting year in early 2002, costs are now reported from 1st April. Hence the five month period ending 31 August 2002 is the first period under the restructured company for which costs are reported

Table 4-2: Comparison of Transaction Model outputs in 2000 (£'m 2000 prices)[23]

Regional Network	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total
Transco	92	120	109	150	77	118	99	155	919
Deloitte	92	120	109	150	77	118	99	155	919

4.15 Table 4-3 below provides a comparison of operating costs allocated to the regional networks for the five months ending 31 August 2002.

Table 4-3: Comparison of Transaction Model outputs in 2002 (£'m 2002 prices)[24]

Regional Network	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total
Transco	32	43	44	57	34	43	41	61	354
Deloitte	32	43	44	57	34	43	41	61	354

4.16 The outputs of our replica model are identical, to within 0.1%, to the Transaction Model. On this basis we confirm that Transco's Transaction Model is functioning as described by Transco.

Conclusions

4.17 The Transaction Model represents a coherent method of modelling internal transactions of products/services between different parts of Transco's business, leading to greater transparency. OFGEM has been concerned to test whether the allocation of operating costs by means of the Transaction Model, is as described by Transco.

4.18 We have developed a replica model based on the same methodology, which uses the same input data as the Transaction Model. Based on our ability to replicate the results of the Transaction Model with our own model, we conclude that the allocation of operating costs presented to OFGEM by Transco is consistent with the application of the methodology of the Transaction Model given in the data provided to us by Transco.

4.19 In the next section, we use our replica model to test the impact of alternative cost allocation scenarios. In order to confirm that our changes to the replica model will produce outputs that would match the output of Transco's actual model, we have performed independent calculations outside of the replica model to confirm the impact of the alternative allocation scenarios. Based on these referencing procedures we believe that our replica model can be used to test alternative allocation scenarios.

4.20 As additional confirmation, we note that we identified an error in Transco's 2002 Transaction Model[25]. We corrected this error and ran a revised version of the model. We compared our output to Transco's corrected output. The outputs of our replica model were within 0.1% of Transco's corrected output.

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23 Source: Transco model output received from Transco on 11 October 2002, Deloitte output per our replica model

24 Source: Transco model output received from Transco on 11 October 2002 and corrected on 22 October 2002. Deloitte output per our replica model

25 The driver LDZ Asset FTE (staff and agency) was not allocating any costs to South West

5 Cost Driver Analysis

Introduction

5.1 In this section we consider the appropriateness of the cost drivers and allocation rules used in the Transaction Model. We also test the sensitivity of allocating certain operating costs to the regional networks using alternative cost drivers and alternative driver data.

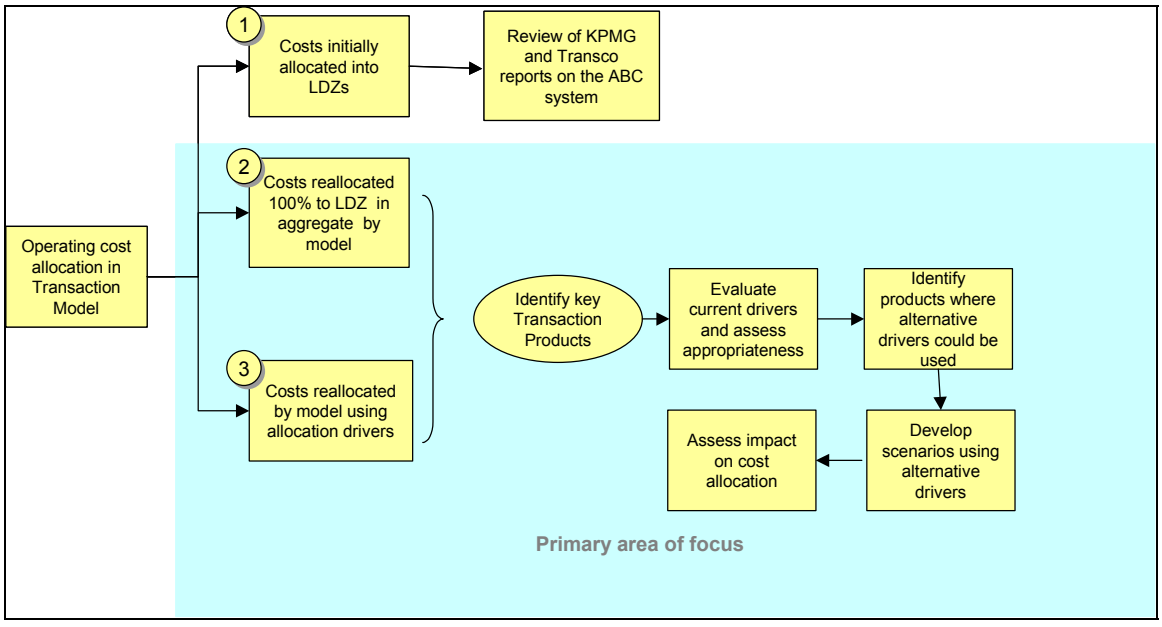
5.2 Specifically, in this section we:

- describe our approach to assessing the appropriateness of drivers and set out our categorisation of operating costs;
- provide an assessment of the attribution/allocation of different categories of costs by Transco;
- consider alternative cost allocation scenarios;
- comment on the validity of data supporting the value of key cost drivers; and
- set out our conclusions.

Our approach

5.3 Figure 5-1 below sets out our approach to assessing the appropriateness of the cost allocation rules used within the Transaction Model.

Figure 5-1: Our approach to the cost driver analysis[26]



26 Source: Deloitte

5.4 Given the complexity and size of the Transaction Model and time constraints, it has not been possible to consider the allocation of each individual Transaction Product. To simplify the review process we have classified Transco's operating costs into three broad categories (highlighted in Figure 5-1), according to the way in which the Transaction Model allocates costs across the LDZs. In addition, we have adopted a sampling approach to ensure that only material cost allocations are considered in detail.

5.5 The three broad cost categories are defined as follows:

- Category 1 reflects Transaction Product costs that are directly attributed to the twelve LDZ divisions[27] via the ABC exercise and, as such, are not subsequently reallocated by means of the Transaction Model;
- Category 2 reflects Transaction Product costs that are directly attributed (i.e. on a 100% basis) from a Business Area to the aggregate LDZ Business Area, and then allocated to individual LDZs by the Transaction Model; and
- Category 3 reflects all remaining costs, which are ultimately allocated to each LDZ by means of the Transaction Model, on the basis of selected cost drivers such as FTEs or number of supply points.

5.6 For the Transaction Products associated with Category 1 costs we have conducted a high level review of the ABC system, based on the KPMG summary report, Transco Action Plan and discussion with Transco, and set out in paragraphs 3.10 to 3.17 above.

5.7 For Category 2 and 3 costs we have considered the allocation of key Transaction Products. In a number of instances we propose alternative drivers. We have developed a range of alternative allocation scenarios and have tested the sensitivity of the final cost allocation to the LDZs. We have also sought to validate the data used for the key drivers.

Categorisation of costs

5.8 In Table 5-1 below we summarise Transco's annual operating costs allocated to the LDZs in 2000 in the three categories as described in paragraph 5.5.

Table 5-1: Results of categorisation of operating costs in 2000[28]

Costs in 2000	£'m 2000 prices	Percentage of total cost
Category 1 costs	394	40%
Category 2 costs	163	17%
Category 3 costs	428	43%

27 In this category we have also included Transaction Product costs that are directly attributed to the twelve Operations divisions that are subsequently reallocated 100% to the corresponding LDZ. As a result Category 1 costs are higher than previously reported in the Andersen Report, which stated that category 1 costs accounted only 7% of the total costs

28 For the purpose of this analysis we considered the absolute amount (i.e. negative values are considered as positive values) of all the costs. This was done to evaluate the total flow of monetary amount allocated by means of a particular driver and to avoid any distortion cause by recharges/contributions recorded as negative costs. As a result, the total of £985m in the table above is great than operating costs in 2000 of £919m. Source: Deloitte calculations

5.9 Our analysis indicates that approximately 40% of annual operating costs can be directly attributed to individual LDZs from the ABC exercise (i.e. Category 1 costs). Approximately 60% of costs are indirectly attributed to the LDZs using specific cost drivers (i.e. Category 2 and 3 costs).

Assessment of Category 1 costs

5.10 Transco implies that 40% of costs can be attributed directly (via the ABC exercise) to individual LDZs. It is our understanding that these costs are incurred directly at a regional level (i.e. within a specific LDZ).

5.11 As our analysis concentrates on an assessment of allocations at a Transaction Product level, we have not assessed costs allocated through the ABC exercise to these Transaction Products.

5.12 It is possible that costs could be inappropriately allocated to the LDZs due to errors at the ABC level. However, we believe that the risks of misstatement as a consequence of the above are likely to be small. In paragraphs 3.12 to 3.15 we noted that that both KPMG and that Lattice Corporate Audit have reviewed the ABC system. We also noted in paragraph 3.16 that Transco has confirmed that the weaknesses identified by KPMG do not impact the allocation of costs across LDZs.

Assessment of Category 2 and 3 costs drivers

5.13 Category 2 and 3 costs account for approximately 60% of total operating costs. The table below summarises the relative importance of the major drivers.

Table 5-2: Summary of cost drivers[29]

Cost Driver	Costs (£'m 2000 prices)	Cost %
Regulatory Value	147	25%
FTE (staff and agency)	144	24%
Evenly	109	18%
Supply Points	59	10%
Shrinkage	42	7%
Throughput	28	5%
Other	62	11%
Total	**591**	**100%**

5.14 The table indicates that the majority of these costs are allocated across the LDZs on the basis of either RAV (25%), FTEs (24%) or evenly (18%).

29 Source: Deloitte calculations

5.15 For Category 2 and 3 costs we have considered the allocation of key Transaction Products. In a number of instances we propose alternative drivers. We have developed a range of cumulative allocation scenarios to test the sensitivity of the final cost allocation to the LDZs. These scenarios are presented in paragraphs 5.29 to 5.53 below.

5.16 Transco has used the RAV in 2000 to drive Formula Rates across the business units and the LDZs. We understand that the RAV is the most appropriate driver for Formula Rates, which are derived and charged to the business on the basis of profitability. Profitability is directly linked to the RAV, given that OFGEM allows a rate of return to be earned on the RAV.

5.17 We understand that as part of the separation of the LDZ price control, OFGEM is proposing to sculpt or adjust the RAV values to ensure that regional price variations are phased in gradually over time. Given that the sculpted RAV will determine profitability, the sculpted RAV should be used to allocate Formula Rates. This gives rise, however, to an issue of circularity.

5.18 As a result, we have treated the allocation of rates separately. We would conclude that it is appropriate to allocate Formula Rates on the basis of the sculpted RAV.

5.19 For illustrative purposes, we have allocated Formula Rates based on the latest values of the sculpted RAV, provided in Table 8.10 of the Initial Consultation Document. This indicative allocation is set out in the table below.

Table 5-3: Indicative allocation of Formula Rates based on sculpted RAV (£'m 2000 prices)

Regional Network	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total
Sculpted RAV	612	998	1,210	1,941	831	880	996	1,908	9,376
Indicative Formula Rates	10	17	20	32	14	15	17	32	156 [30]

5.20 We stress, however, that the allocations above are indicative. The final allocation can only be made once OFGEM has combined the relevant elements of the price control and has considered the impact on regional price variations.

Impact of restructuring in 2002

5.21 We understand that OFGEM intends to use the allocation of costs across LDZs derived by our analysis of the 2000 cost base to allocate the LDZ price controlled operating cost allowance to regional networks. We understand, however, that Transco has undertaken significant restructuring since 2000. This restructuring could change the allocation of costs between LDZs and, as a result, it may not be appropriate to use the 2000 allocation of costs to allocate allowable operating costs throughout the price control period. For example, cost savings made in 2002 by reducing FTE numbers may not have been made uniformly across the LDZs.

30 As agreed by OFGEM

5.22 We understand that most of Transco's restructuring has occurred during the year 2002. We have sought to understand the impact of restructuring based on the latest data available (i.e. actual data for the five months ended 31 August 2002).

5.23 At a high-level restructuring appears to have made a significant impact on the split of costs allocated across LDZs. The can be seen in the table below which allocates allowable operating costs (excluding Formula Rates) based on proportions derived from both the 2000 and 2002 Transaction Models.

Table 5-4: Comparison of the allocation of operating costs in 2000 and 2002, £m 2000 prices[31]

Regional Network	2000 %[32]	Allowed opex	2002 %	Allowed opex	Difference
01 – SC	10.1%	69	9.6%	66	(3)
02 – N&Y	13.3%	91	12.5%	86	(5)
03 – NW	11.8%	81	12.4%	85	4
04 – EE	16.0%	110	15.0%	103	(7)
05 – WM	8.4%	58	9.6%	66	8
06 – W&SW	12.7%	87	12.5%	86	(1)
07 – NL	10.9%	75	11.7%	80	6
08 – S&SE	16.8%	115	16.5%	113	(2)
Total	100.0%	686 [33]	100.0%	686	0

5.24 The table indicates that Transco's restructuring could have a significant impact on the way in which costs are allocated to LDZs. For example, the West Midlands would be allocated an additional £8 million if the 2002 Transaction Model were used.

5.25 We have conducted variance analysis to test whether the difference between the two models could be explained by changes in drivers. This analysis showed that the changes in drivers explained the difference to some extent. Of particular significance were changes in the following driver values:

- FTE (staff & agency); and
- evenly (i.e. the change from allocating costs to each LDZ by applying one twelfth of the cost, to allocating costs to each region by applying one eighth of the cost).

31 Source: Deloitte calculations

32 The 2000 percentages differ from those set out in Table 8.2 of the Initial Consultation Document as they exclude Formula Rates

33 Allowed operating cost total of £842m (Table 8.3 of the Initial Consultation Document), less Formula Rates of £156m (agreed by OFGEM)

5.26 We understand that the 2002 driver values include the impact of restructuring. This is particularly the case for the FTE driver, which incorporates significant staff reductions. In general, we believe that it is appropriate to use drivers, which reflect significant changes due to Transco's restructuring, to allocate costs to LDZs. This approach is adopted in the scenario section below.

5.27 We also believe that it is not appropriate to use the five month cost data to 31 August 2002 to determine the allocation of costs to LDZ, for the following reasons:

- the 2002 model only covers five months of data. It is possible that costs at a transaction product level will accrue at different rates over the year. It is possible, therefore, that the aggregate allocation of costs after five months will differ from the aggregate allocation of cost after 12 months; and

- it is not clear that the costs in 2002 reflect a "normal" year, given that they include restructuring costs. One off restructuring costs may bias the allocation of costs across LDZs.

5.28 As a result, we believe that it is inappropriate to use the 2002 model as a basis for allocating costs. Therefore, we have used the Transaction Model in 2000 to consider the allocation of costs, but we have made adjustments to certain drivers, to reflect known changes in 2002.

Alternative cost driver scenarios

5.29 For Category 2 and 3 costs we have considered the allocation of key Transaction Products. In a number of instances we propose alternative drivers. We have developed a range of cumulative allocation scenarios and have tested the sensitivity of the final cost allocation to the LDZs. These scenarios fall into three stages:

- **Step 1** reflects changes Transco has made cost allocation rules since 2000 in order to improve the Transaction Model, and changes the FTE driver to reflect the post restructuring level of FTE figures for LDZs and Operations staff.

- **Step 2** reflects drivers for which we and OFGEM jointly think there is a better driver.

- **Step 3** covers joint and common costs for which no clear driver exists. Transco currently allocate these costs to LDZs either on the basis FTEs or equally. We have derived three alternative scenarios. The three scenarios allocate costs on the following basis:

  - equi-proportional (referred to as "Step 3e");

  - alternative FTE, which includes industrial staff and is adjusted to reflect FTEs in 2002 for LDZs and Operations Staff (referred to as "Step 3f"); and

  - throughput, which we understand is one of OFGEM's preferred indicators of the size of an LDZ (referred to as "Step 3t").

5.30 Each of these steps, and their impact on the allocation of costs, are set out in detail in the sections below.

Step 1

5.31 In this step we adjust drivers to reflect changes Transco has made to cost allocation rules since 2000 in order to improve the Transaction Model. In addition, we adjust the 2000 FTE driver to reflect the post restructuring level of FTEs for LDZs and Operations staff.

5.32 The table below details where cost allocation rules have changed.

Table 5-5: Changes to drivers since 2000 - £'m[34]

Product	Description	Cost	2000 Rule	2002 Rule
00SUP-P002	Procurement & Logistics	9.3	Evenly	RNR Materials Costs
00REG-P002	Licence Fee	7.1	Evenly	Supply Points
00REG-P003	Other Regulations	4.9	Evenly	Supply Points
00TIT-P070	Telecoms – PMR	4.6	Evenly	LDZ Industrial FTE
Other	Various	6.1	Various	Various

5.33 The table only details those Transaction Products with costs greater than £2 million allocated to the LDZs. A full list of all Transaction Products changed in this step is provided in Appendix 2.

5.34 The impact of changes made in Step 1 is set out in Table 5-6 below. Note that the proportions have been determined using actual costs in 2000, excluding Formula Rates (i.e. £919m less £147m). These proportions have then been applied to the allowable level of operating costs as set by the last price control for the aggregate LDZ, excluding Formula Rates (i.e. £686m).

Table 5-6: Step 1 impact on the allocation of operating costs[35]

LDZ	2000 Proportions	Allowed Opex £'m	Step 1 Proportions	Allowed Opex £'m	Difference £'m
01 - SC	10.1%	69	10.1%	69	0
02 – N&Y	13.3%	91	13.8%	94	3
03 - NW	11.8%	81	12.0%	82	1
04 - EE	16.0%	110	15.6%	107	(3)
05 - WM	8.4%	58	8.6%	59	2
06 – W&SW	12.7%	87	12.5%	86	(1)
07 - NL	10.9%	75	10.8%	74	(1)
08 – S&SE	16.8%	115	16.7%	114	(1)
Total	**100.0%**	**686**	**100.0%**	**686**	**0**

5.35 It can be seen that step 1 has an impact of up to £3 million on the allowed level of operating costs in a particular region. In general, costs move towards North and Yorkshire and away from East England. The main cause of this change can be explained by changes in the FTE driver, and in particular changes to Operations FTEs (staff and agency). The largest fall in OPS FTEs post restructuring in 2002 was in East Anglia and conversely the largest increase in OPS FTEs was in the North LDZ (now part of the North and Yorkshire regional network).

34 Source: Deloitte calculations

35 Source: Deloitte calculations

Step 2

5.36 We have performed a high level review, jointly with OFGEM, to consider the appropriateness of drivers. In this step, we have identified 9 transaction products for which we and OFGEM have identified a better driver.

5.37 The details of the transaction products for which we suggest different drivers are summarised in Table 5-7 below. The table details only those Transaction Products with costs greater than £2 million allocated to the LDZs. A full list of all Transaction Products changed, and the rationale for the changes in this step is provided in Appendix 2.

Table 5-7: Step 2 alternative cost drivers - £'m [36]

Product	Description	Cost	Transco Rule	D&T/OFGEM Rule
00LTO-P001	Engineering Services R&D	26.3	Equal	Length of Total Mains
00OPC-P001	Ops Centre Functions	14.9	FTE	Length of Total Mains
00LDC-P001	LDZ Centre Functions	13.9	FTE	Supply Points
00SUP-P003	Learning & Development	5.5	FTE	FTE (incl industrial)
00CNC-P001	Connections Centre Functions[37]	4.8	Evenly	Supply Points
00SUP-P004	Operational HR	3.0	FTE	FTE (incl industrial)
00SYS-P015	Operational Systems Development	2.2	Evenly	Length of Total Mains
Other	Various	1.7	Various	Various

5.38 The table below shows the combined impact of both Step 1 and 2.

36 Source: Deloitte calculations

37 Transco have stated "this product is a one off cost in 2000 relating to setting up the separate connections business". We believe that supply points is the right driver to allocate this product. We note that ordinarily one might seek to remove "one- off" costs. We have not undertaken a review to determine which Transaction Products are not representative of forward looking costs (typically this would be performed during a review of allowable costs) and hence to remove "one-off" costs on a random basis would be inappropriate. Given that the allowance for total allowable costs has already been determined, and that any difference between costs in 2000 and the allowance for total operating costs is scaled on an equi-proportional basis, we do not believe that our preferred choice of driver (i.e. supply points) would yield a materially different allocation

Table 5-8: Step 1 & 2 cumulative impact on the allocation of operating costs (excluding Formula Rates)[38]

LDZ	2000 proportion	Allowed opex £'m	Step 2 proportion	Allowed opex £'m	Difference £'m
01 - SC	10.1%	69	10.0%	69	0
02 – N&Y	13.3%	91	13.4%	92	0
03 - NW	11.8%	81	12.3%	84	3
04 - EE	16.0%	110	15.7%	108	(2)
05 - WM	8.4%	58	8.5%	58	1
06 – W&SW	12.7%	87	12.2%	84	(3)
07 - NL	10.9%	75	10.9%	75	0
08 – S&SE	16.8%	115	16.9%	116	1
Total	**100.0%**	**686**	**100.0%**	**686**	**0**

5.39 This scenario has an overall impact on the allocation of operating costs of up to £3m. In general terms, under Step 2 a number of drivers change from equal to supply points or length of mains. The impact of this on the allocation of costs to Wales, for example, can be explained as follows. Wales has a lower proportion of supply points and length of mains than other regions and thus receives a lower share of costs now driven on these bases.

Step 3

5.40 As indicated above, for certain support costs, alternative cost drivers could be justified. In this Section, we consider the impact of using drivers for the allocation of these costs.

5.41 We have identified 24 Transaction Products (accounting for 19% of Category 2 and 3 costs or £111 million in 2000) where alternative cost drivers could be considered.

5.42 These Transaction Products can be regarded as support activities and are currently allocated on the basis of either FTEs or evenly across LDZs. There is some flexibility in the allocation of support costs. Manpower approaches for making allocations, such as FTEs, are commonly employed, but other approaches exist and may in some circumstances appear superior. These different approaches often yield significantly different results.

5.43 To test the sensitivity of allocating these costs on a different basis we have derived three alternative allocation scenarios. The three scenarios allocate costs on the following basis:

- in proportion to the initial direct cost ("DC") allocations, often referred to as an equi-proportional approach. This approach recognises that multiple factors might drive costs. It also recognises that in many instances the number of people employed do not drive costs (e.g. Strategy). This approach was adopted by OFGEM in its review of BGT. We refer to this driver as Scenario 3e

- in proportion to throughput. This approach attributes costs in proportion to the size of the business. This approach might be more applicable to network businesses where

38 Source: Deloitte calculations

operating costs assume a small proportion of total costs. We understand throughput is one of OFGEM's preferred indicators of the size of an LDZ. We refer to this driver as Scenario 3t; or

- using an adjusted FTE driver, which includes Industrial employees[39]. We refer to this driver as Alternative FTE or Scenario 3f.

5.44 The Transaction Products impacted in this step are highlighted in the Table 5-9 below. The table details only those Transaction Products with costs greater than £2 million allocated to the LDZs. A full list of all Transaction Products changed in this step is provided in Appendix 2.

Table 5-9: Step 3 support costs - £'m [40]

Product	Description	Cost	Transco Rule
00COR-P001	Corporate Recharge	41.4	FTE
00SUP-P001	Finance[41]	21.4	Evenly
00TIT-P016	LDZ - Miscellaneous	13.7	Evenly
00OCD-P010	ExCom	3.8	FTE
00TIT-P049	ServiceCo - Misc[42]	3.7	FTE
00OCD-P003	Strategy	3.7	FTE
00OCD-P002	Other Planning & Finance	3.5	FTE
00TIT-P072	Telecoms Communications Towers	2.8	Evenly
00LTO-P002	Property & Governance	2.1	FTE
Other	Various	15.0	Various

5.45 Our results, showing the allocation of costs to different LDZs, are shown in the table below. Note that the table shows the cumulative impact of all changes, including changes made in Steps 1 and 2.

39 Alternative FTE driver values calculated using Transco's data on FTEs provided on 22 October 2002

40 Source: Deloitte calculations

41 Transco has stated that this product has since been split into several products, each with its own separate driver. We are unable to confirm this with the 2002 Transaction model. It could be argued that this type of cost is difficult to allocate directly or indirectly and that alternative allocation approaches exist. We believe that the correct approach is to consider its allocation in a manner that is consistent with other shared costs

42 Transco has stated that this system is no longer valid/exists. As explained in footnote 37, we have not sought to remove all one-off costs form this analysis

Table 5-10: Step 1-3 cumulative impact on the allocation of operating costs (excluding Formula Rates)[43]

LDZ	2000 %	Allowed opex £'m	Step 3e %	Impact £'m	Step 3f %	Impact £'m	Step 3t %	Impact £'m
01 – SC	10.1%	69	10.2%	1	10.1%	0	10.0%	0
02 – N&Y	13.3%	91	12.9%	(3)	13.1%	(1)	12.9%	(3)
03 – NW	11.8%	81	12.6%	5	12.7%	6	12.6%	5
04 – EE	16.0%	110	15.7%	(2)	15.8%	(1)	15.9%	(1)
05 – WM	8.4%	58	8.4%	0	8.5%	1	8.5%	0
06 – W&SW	12.7%	87	11.9%	(5)	12.0%	(5)	11.9%	(5)
07 – NL	10.9%	75	11.2%	2	11.0%	1	11.2%	2
08 – S&SE	16.8%	115	17.1%	2	16.8%	0	17.0%	2
Total	**100.0%**	**686**	**100.0%**	**0**	**100.0%**	**0**	**100.0%**	**0**

5.46 The results of our sensitivity analysis indicate that the allocation of costs to each LDZ is sensitive to the changes to the cost drivers. The results also indicate that three alternative scenarios yield consistent results. For example, it can be seen that operating costs allocated the North West increase by up to £6m whilst operating costs of up to £5 million are allocated away from Wales and South West.

Summary of the sensitivity of the allocation of costs to alternatives

5.47 Table 5-11 below summarises the cumulative results of our analysis. The table shows the change in the allocation of allowed operating costs in 2002/03 (excluding Formula Rates) compared to the results of Transco's analysis based on the 2000 Transaction Model.

43 Source: Deloitte calculations

Table 5-11: Summary of the cumulative results of our sensitivity analysis (£'m 2000 prices) [34]

Network	Step 1	Step 2	Step 3e	Step 3f	Step 3t
01 – Scotland	0	0	1	0	0
02 – North and Yorkshire	3	0	(3)	(1)	(3)
03 – North West	1	3	5	6	5
04 – East England	(3)	(2)	(2)	(1)	(1)
05 – West Midlands	2	1	0	1	0
06 – Wales and South West	(1)	(3)	(5)	(5)	(5)
07 –North London	(1)	0	2	1	2
08 – South and South East	(1)	1	2	0	2
Change in allowed opex 2002/03	0	0	0	0	0

Validation of driver data

5.48 In addition to our analysis on the appropriateness of drivers we have requested information to support the actual driver data (e.g. validation of the level of FTEs by LDZ).

5.49 We have been able to obtain supporting information (such as internal publications on demand forecasting data) to validate the following key drivers:

- Supply points
- Throughput

5.50 We also requested support for the following drivers:

- FTE figures
- Shrinkage
- Capital Contributions

5.51 Transco has indicated that driver data is extracted from budgeting models on a bottom-up basis and that each LDZ has provided relevant data directly. Transco indicates that it is not easy to provide back up for these figures in the form of audited or internal management reports.

5.52 As a result we have been unable to reconcile all of the key drivers back to supporting records. Without further information we are unable to conclude whether costs have been allocated in the correct proportions. As a result we recommend to OFGEM that further information should be obtained from Transco to support the allocation of certain Transaction Products.

5.53 At this stage OFGEM has not asked us to perform further work in this area on the basis that any misstatements or errors are unlikely to have a significant impact on the allocation of costs to Price Control Units for the following reasons:

- these drivers account for only 11% of total operating costs (after our proposed changes in the scenario analysis above);

- we were able to confirm the validity of drivers based on supply points, throughput and RAV which provides some evidence that drivers are generally correctly stated; and

- cost allocations do not appear to be biased towards any particular LDZ.

Conclusions

5.54 We have found no evidence that the allocation of operating costs is inconsistent with a reasonable expectation of cost causality. We have not identified any evidence to suggest that the costs have been allocated in a biased manner.

5.55 Overall we believe that there are a number of Transaction Products for which alternative drivers are more appropriate and should be adopted. We believe that these changes have a small impact on the final allocation of costs.

5.56 In Step 3, we have considered a number of alternative drivers. The alternatives proposed appear equally appropriate to the driver currently being used by Transco, but given the nature of the costs there is unlikely to be a single "correct" driver. We note that the original Andersen Report supported this view and that Transco has acknowledged this in the past[44].

5.57 We believe that the Direct Cost (i.e. Scenario 3e) method is superior for the following reasons:

- it is consistent with prior OFGEM precedent (such as was the case with BGT);

- it avoids problems with the appropriate definition of FTEs (such as whether it should include agency and industrial staff);

- it recognises that not all support costs are driven by manpower related costs (e.g. strategy related costs); and

- it recognises that multiple factors might drive costs.

5.58 Therefore, we believe that it is appropriate to allocate operating costs in 2002/03 to the regional networks based on the proportions stated under Scenario 3e in Table 5-10 above.

5.59 We understand that OFGEM intend to use these proportions to allocate costs in each of the price control years. We have not undertaken any work to verify whether this assumption is valid. It is possible for example that regional networks could grow or change at different rates, requiring a different proportion of operating costs in later years.

5.60 Based on OFGEM's preferred approach, Table 5-12 below summarises the allocation of operating costs to the regional networks over the price control period.

44 Transco Initial Response to Andersen's Draft Paper Report 20 June 2001, p 5

Table 5-12: Deloitte alternative allocation of operating costs [34]

Network	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total	Formula Rates	Total OPEX
02/03	70	89	86	108	58	82	77	118	686	156	842
03/04	68	86	83	104	56	79	74	114	663	158	821
04/05	66	83	81	100	54	76	71	110	640	163	803
05/06	63	80	78	97	52	74	69	106	620	172	792
06/07	61	77	75	94	50	71	67	103	599	182	781

5.61 We draw OFGEM's attention to our recommendations on Formula Rates. We believe that Formula Rates should be treated separately and driven on the basis of sculpted rates.

5.62 This final allocation can only be made once OFGEM has combined the relevant elements of the price control and has considered the impact on regional price variations.

5.63 Finally we would note that Transco is in the process of restructuring its business. Where possible we have incorporated the impact of this restructuring, by using updated driver data. We note that this may not present a true picture of the way costs will be allocated to the regions post-restructuring. However at this point in time we believe our approach, by making use of the most up-to-date information available, may be the best guide to the way costs may be allocated in the future.

6 Regulatory Asset Value

Background

6.1 We have been engaged by OFGEM to review how Transco has allocated assets and the RAV to the regional networks.

6.2 OFGEM's Final Proposals on Transco's price control from 2002 sets the RAV for the LDZ, in aggregate, at £9,376 million. We understand that Transco has allocated this total across regional networks on the basis of each regional network's NBV. We note that the NBV was derived as part of an asset survey undertaken by Transco, which was included in their BPQ response in 1999.

6.3 OFGEM's Initial Consultation Document allocates the RAV on this basis. Table 6-1 below summarises their initial conclusions:

Table 6-1: Regional network RAV as at 1 April 2002 (£'m, 2000 prices)[45]

	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total
RAV	902	1,104	1,082	1,640	747	1,354	943	1,604	9,376

6.4 We have been engaged by OFGEM:

- to review the methodology for allocating assets and for determining the RAV for each LDZ;
- to discuss the reasonableness of the approach jointly with Transco and OFGEM's technical experts;
- to ensure that Transco's methodology is consistent with the approach adopted by the MMC in the May 1997 MMC report;
- to perform an independent roll forward of assets with appropriate age profile assumptions to ensure the accuracy and sensitivity of Transco's calculations; and
- to assess whether the overall estimate of NBV for each LDZ appears reasonable and reconcile these to the LDZ RAV in the Final Proposals.

6.5 In this section, therefore, we:

- set out our understanding of Transco's methodology for determining the RAV for each LDZ;
- provide a reconciliation between Transco's derivation of the RAV by LDZ to OFGEM's Final Proposals;
- set out the results of our review of Transco's allocation methodology; and
- draw conclusions on the allocation of the RAV across LDZ's as set out in the Initial Consultation Document.

45 Source: Table 8.6 in OFGEM's Initial Consultation Document

6.6 In performing our work, it is important to note that we do not audit or form an opinion on the accuracy of Transco accounting or asset registers. It has been assumed that the information provided has been audited and verified by Transco's own internal management or auditors.

6.7 Furthermore, the scope of our work does not extend to providing assurance or due diligence on which assets belong within each LDZ. The nature of our work is to assess the appropriateness of Transco's methodology and approach to allocating the allowed RAV.

6.8 Finally, it is also important to note that we do not provide any assessment on how the RAV should ultimately be allocated to each regional network. OFGEM indicates in its Initial Consultation Document[46], that the initial estimate of RAV for each LDZ may need to be adjusted or sculpted to mitigate any initial regional variations in consumer gas prices. We understand that OFGEM will determine this final adjustment.

Overview of Transco's methodology for allocating RAV across LDZ's

6.9 In this section, we provide an overview of Transco's methodology for determining each regional network's RAV. In summary, Transco adopts a five-step process. This process is set out below.

Step 1: Determine opening RAV for Transco as a whole

6.10 Transco's starting position is the aggregate RAV, as at 31 April 1997, as determined by the MMC[47].

6.11 We understand that the RAV was based on the asset values per the 1996 statutory current cost accounts ("CCA") and that the RAV was broken down into 26 asset categories, but not by price control unit or by individual LDZ.

Step 2: Roll forward of RAV to 1999

6.12 As part of the BPQ response to support submissions on Transco's price control from 2002, Transco rolled forward the opening RAV, by asset category, to 31 December 1999. The roll forward was performed on an actual basis (i.e. adjusting for actual capital spend, depreciation and disposals) and is consistent with the MMC's methodology for rolling the RAV forward.

6.13 Transco terms the result of this roll forward the "Target RAV".

Step 3: Determine the NBV for each LDZ as at 1999

6.14 Transco has performed a bottom up analysis to calculate the NBV of each LDZ as at 31 December 1999. This asset value is used to allocate the RAV across LDZs.

6.15 The bottom up process is explained in general terms below for five key asset categories[48] that account for approximately 99.8% of the NBV total.

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46 See paragraph 8.15 of the Initial Consultation Document

47 We do not provide extensive detail on the MMC's methodology here. However it is important to clarify certain key assumptions used in the MMC approach, as these have been adopted subsequently by Transco in their roll forward of the RAV (Step 2) and in determining the NBV of each LDZ (Step 3). These are that: a Market Adjustment Ratio ("MAR") adjustment of 60% was applied on the value of all pre-1992 assets; the value of assets should be rolled forward from 1997 onwards on basis of changes to RPI rather than by reference to CCA replacement cost; depreciation should be calculated on a straight-line basis, and for pre-1992 assets depreciation should be based on the MAR-adjusted value.

6.16 For Mains, Services, Storage and LTS Pipes, the bottom up approach can be explained as follows:

- for assets acquired prior to 1997 the gross book value "GBV" for each LDZ is calculated indirectly by multiplying annual additions[49] (i.e. 1937 to 1999) by a replacement unit cost. This approach is consistent with the CCA methodology set out by the MMC;
- for assets acquired post 1997, Transco's internal systems measure the GBV of additions for each LDZ directly[50]; and then
- the NBV by asset category of each LDZ was calculated by adjusting the GBV for the Market Adjustment Ratio (for pre-1992 assets) and adjusting for depreciation on a straight-line basis.

6.17 This bottom up analysis provides a NBV of each LDZ by asset category. For each asset category, the NBV of each LDZ is then scaled to the asset category's Target RAV on an equi-proportional basis. We note that materially the NBV and the Target RAV are equivalent in value terms[51].

6.18 For Land and Buildings, the GBV of each LDZ was determined directly using the latest valuation report conducted by FPD Savills in 1997/98. The total value of Land and Buildings per the Valuation Report does differ significantly from the Target RAV. As a result the Target RAV is allocated across LDZ's on the basis of the proportion of the total value in each LDZ in the 1998 Valuation Report.

6.19 Finally, the scaled value of each asset category is summed to produce an estimate of the RAV for each LDZ as at 31 December 1999, as set out in Table 6-2 below.

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48 The asset categorises are Mains, Services, Storage, LTS Pipe and Land and Buildings. The other asset categorise include plant and machinery, telecoms, computers, etc

49 Mains and LTS pipe are recorded in terms of length of pipe. Domestic and non domestic services are recorded in terms of number of services. Storage is measured in terms of Statistical Units - '000 Cubic metres effective capacity. The systems used for this exercise were: Engineering records for Mains, which recorded pipeline length by LDZ by year; and the MINE system for Services, Storage and LTS pipes that recorded pipeline length and storage capacity by LDZ and by year installed

50 This approach is consistent with the MMC assumptions set out in 1997. For pre-1997 assets the RAV was calculated on a CCA basis using standard replacement costs. For post -1997 assets an RPI indexation methodology replaced the CCA approach

51 The slight difference from the Target RAV is due to the following factors: the bottom up approach used individual unit costs for each LDZ whilst Target RAV used a single standard replacement cost for valuing pre-1997 Mains and Services; and the bottom up approach calculated disposals by LDZ whilst the Target RAV calculated disposals on a Total Transco basis

Table 6-2: RAV by Network as at 31 December 1999 (£'m, 1999 prices)[52]

	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total
RAV	868	1,016	1,012	1,580	685	1,242	874	1,473	8,749
% of Total	9.9%	11.6%	11.6%	18.1%	7.8%	14.2%	10.0%	16.8%	100%

Step 4: 2000 RAV by LDZ determined using 1999 split

6.20 Transco then calculate the Target RAV, by asset category, as at 31 December 2000. Again, the roll forward was performed on an actual basis (i.e. adjusting for actual capital spend, depreciation and disposals).

6.21 As Transco has not repeated the bottom up exercise for the year ending 31 December 2000, they use the NBV asset split determined in 1999 to allocate the RAV to LDZs. Table 6-3 below shows the RAV by Network as at 31 December 2000 as determined by Transco[53].

Table 6-3: RAV by Network as at 31 December 2000 (£'m, 2000 prices)[54]

	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total
RAV	890	1,061	1,034	1,622	711	1,293	908	1,526	9,047
% of Total	9.8%	11.7%	11.4%	17.9%	7.9%	14.3%	10.1%	16.9%	100%

Step 5: Roll forward to start of price control and to 2007 on network basis

6.22 Transco then rolled the RAV forward for each LDZ to the start of the price control (i.e. 1 April 2002) and to 31 March 2007 using projections of capex, repex, and depreciation[55]. The results of this approach are summarised in Table 6-1.

Reconciliation

6.23 In this sub section we reconcile Transco's aggregated RAV rolled forward from 1997, to the LDZ RAV agreed at the beginning of the current price control. Specifically, we review and set out:

- the aggregate RAV per Transco in 1997 as determined by the MMC (step 1);

52 Source: Information received from Transco, September 2002

53 The percentages set out in Table 6-3 differ slightly from those set out in Table 6-2 for a number of reasons: Transco conducted the allocation on an asset category basis; some minor categories were allocated differently to reflect changes in the business structure; and Transco then scaled its Target RAV to that reflect an LDZ-metering adjustment made by OFGEM for the current price control period

54 Source: Information received from Transco, September 2002

55 This roll forward was consistent with the methodology determined by the MMC amended for OFGEM's preferred depreciation policy

- the roll forward of this aggregate RAV to 1 January 2002, on an actual spend basis (step 2);

- an application of the 1999 % RAV for each LDZ derived in Transco 1999 allocation process to the opening RAV as at 1 January 2001 (step 4); and

- a roll forward of the LDZ aggregate RAV from 1 January 2001 to 31 March 2002 (step 5).

6.24 In the next sub section we then set out our review of Transco's allocation methodology (step 3).

6.25 The RAV was set by the MMC in 1997 for Transco at £10.9bn[56] in 1996 average prices (£12.2bn in 2000 mid prices[57]). The RAV as at 31 December 2001 agrees to Table 5.2 of the Final Proposals [58]. Table 6-4 below sets out a roll forward on a Total Transco basis, from the RAV set by the MMC as at 1 April 1997 to 31 December 2001.

Table 6-4: Roll forward of MMC RAV on a total Transco basis (£'m, 2000 prices)[59]

	1997	1998	1999	2000	2001
Opening RAV	12,201	12,199	12,277	12,251	12,471
Net additions	497	715	611	871	1,101
Disposals	(80)	(63)	(54)	(62)	(74)
Depreciation	(421)	(576)	(584)	(591)	(577)
Closing RAV	12,199	12,277	12,251	12,471	12,921

6.26 Table 6-5 below sets out a comparison of the RAV by network determined by Transco as at 1 January 2001[60] to the allocation based on percentages derived in the initial allocation process in 1999[61]. It should be noted that this calculation is an approximate calculation for a number of reasons:

- we have been unable to reperform exactly Transco's derivation of the 2000 RAV at an LDZ level as Transco conducted this process on an asset category basis across all Price Control Units rather than on an LDZ basis;

- some minor asset categories were split in a different way to the 1999 split to reflect changes in the structure of the business[62]; and

56 Page 393 of the MMC Report

57 Recalculated by Deloitte using RPI figures agreed by Ofgem

58 This breakdown in Table 5.2 was based on the 2001 data from Transco's BPQ submission.

59 Source: Information received from Transco, 31 October 2002

60 As detailed in step 4 in paragraph 6.20

61 As set out in Table 6-2

62 Mainly computers

- Transco then scaled the Target RAV to that determined by OFGEM during the current price control.

6.27 Given the above factors we have conducted an independent roll forward of the RAV by LDZ from 31 December 1999 to 31 December 2000. This is described in detail in paragraphs 6.34 and 6.35.

Table 6-5: Application of the percentages derived in initial allocation process in 1999 to the RAV as at 1 January 2001 (£'m 2000 prices)[63]

	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE	Total
RAV as determined by Transco	890	1,061	1,034	1,622	711	1,294	909	1,526	9,047
Application of 1999 %	898	1,050	1,047	1,633	708	1,284	903	1,523	9,047
% Difference	0.8%	(1.0%)	1.2%	0.7%	(0.4%)	(0.8%)	(0.6%)	(0.2%)	0%

6.28 Table 6-6 below shows the opening RAV as at 1 January 2001 for LDZ rolled forward to the beginning of the current price control period. We also set out in Appendix 3 this roll forward on a disaggregated LDZ basis.

Table 6-6 : Roll forward of LDZ Aggregate RAV as at 1 January 2001 to 31 March 2002 (£'m, 2000 prices)[64]

	1 January 2001 to 31 December 2001	1 January 2002 to 31 March 2002
Opening RAV[65]	9,047	9,297
Net capex	333	65
Net repex	325	110
Depreciation	(409)	(95)
Closing RAV	9,297	9,376

Review of Transco's allocation methodology

6.29 Overall, we believe that Transco has adopted a valid approach to allocating the RAV between regional networks. The key focus of our work, therefore, has been to test the sensitivity and the assumptions that underpin Transco's bottom up approach to derive the NBV for each LDZ.

6.30 In this sub section, therefore we:

63 Source: Deloitte calculation

64 Source: Information received from Transco, September 2002

65 This is the separation of the RAV determined by OFGEM as part of the current price control. It is from this basis that Transco has rolled forward the RAV on an LDZ by LDZ basis from 2002 to 2007

- re-perform the calculations that underpin Transco's methodology to ensure no significant computational errors have been made;

- review the consistency of Transco's methodology with the approach adopted by the MMC; and

- outline and review the key model assumptions, including a review of the systems used to derive asset data, a review of inputs (in particular unit costs and asset lives) and perform sensitivity analysis of the RAV allocation to changes in key assumptions.

Re-performance of Transco's calculations

6.31 We have re-performed Transco's calculations in deriving the NBV for the four key asset categories and for the allocation of the Target RAV across the LDZ for all asset categories. We have identified a small number of computational errors. Correcting for these errors yields a minor difference in the allocation of RAV to each region of less than 0.01%.

6.32 In reviewing the calculations we also discovered a minor inconsistency in the way Transco allocates the Target RAV to each LDZ. In summary, Transco allocates the Target RAV for 1997 to 1999 assets on the basis of GBV, but uses the NBV for pre-1997 assets.

6.33 We believe that a more consistent approach would be to use the NBV of both pre and post 1997 assets to allocate the Target RAV. We have re-performed this allocation using our preferred approach. The impact of using this alternative approach is presented as the 'preferred allocation method' in Table 6-9 below. This does not produce a material difference in the allocation of the RAV across networks.

6.34 Furthermore, and as noted above, to derive the RAV at the beginning of the current price control period, Transco applied the 1999 split of the assets to the Target RAV as at 31 December 2000. We have considered whether it is appropriate to use the 1999 split of assets to allocate the Target RAV in 2000. To do this we have performed a roll forward of RAV by LDZ from 31 December 1999 to 31 December 2000, using capex and repex forecasts provided in the BPQ and by calculating depreciation using a straight-line basis.

6.35 This roll forward shows that the split of RAV by LDZ does not change materially over the course of the year. We would conclude that Transco's use of the 1999 split in 2000 is unlikely to cause a material misstatement in the allocation of RAV across the LDZs.

6.36 Overall, we conclude that the methodology and calculations used by Transco to determine the allocation of the RAV appear appropriate. In the following sub sections we detail the key assumptions used in the allocation process and perform sensitivities on these assumptions.

Review of the consistency of Transco's methodology with MMC

6.37 We have reviewed Transco's approach and agree that it is consistent with the methodology set out in the MMC Report.

Review of assumptions and inputs

6.38 Transco has derived LDZ asset information from a number of systems. It is this data combined with a number of assumptions, which drives the 'bottom up' NBV for each LDZ and ultimately the allocation of the Target RAV to each LDZ.

6.39 The key assumptions and inputs that drive the allocation of the RAV in Transco's calculation are:

- information derived from Transco's Engineering and MINE systems that record asset addition (in terms of length of pipes, number of services, etc) in each LDZ by year;

- unit costs used to calculate GBV in each of the key asset categories;
- asset lives; and
- the allocation proportions that drive the allocation of Land and Buildings to each LDZ.

6.40 We set out below a summary of our review of each of these areas.

Review of Transco's systems

6.41 In order to ascertain the accuracy of the NBV calculation, we asked Transco to provide information to provide assurance that data (e.g. km length of mains installed in any given year) had been entered accurately into the relevant systems (e.g. from audit reports, summary of control mechanisms, summary of data capture routines, etc).

6.42 Transco indicated that due to the historical nature of this data capture, they were unable to provide any information from which we could gain assurance on the accuracy of information derived from these systems.

6.43 We believe, however, that it is unlikely that their systems would be materially misstated in terms of the allocation of assets across LDZs, for the following reasons:

- Transco state that "the systems providing key information have previously fallen within the scope of the Regulatory and Statutory audit. Transco believes that this provides support as to the accuracy of this information"; and
- the bottom up approach reconciles closely to the top down approach which is used to calculate the Target RAV. If the bottom-up approach was based on inaccurate data, it might be expected to yield a significantly different result.

6.44 In Table 6-7 below we set out the Target RAV and the NBV by asset category derived using the bottom up approach. We set out both Transco's NBV derived from their bottom up methodology and that calculated by Deloitte using our preferred allocation methodology set out in paragraph 6.33.

Table 6-7: Comparison of Target RAV and Bottom up approach (£'m, end 1999 prices)[66]

Asset Category	Target RAV	Bottom up approach per Transco	Bottom up approach per Deloitte	Difference between Target RAV and Deloitte
Mains	5,470	5,388	5,395	1.4%
Domestic services	1,734	1,745	1,750	-1.0%
Non domestic services	206	224	225	-9.2%
LTS Pipes	1,116	1116	1,120	-0.4%
HP Storage	10	10	10	-0.3%
LP Storage	16	16	17	-0.5%

Review of unit costs

6.45 For the four key asset categories[67], the GBV of pre-1997 assets has been calculated by multiplying standard replacement unit costs[68] by actual additions (i.e. kilometre length of pipe or cubic metre of storage). The allocation of the RAV is sensitive to the value of unit costs used in this calculation.

6.46 The unit costs for Mains and Services are LDZ specific. We understand that:

- Mains unit costs are derived from Transco's Mains Valuation model. This uses contractors' invoices adjusted for specific local factors such as diameter band; and
- Domestic Services unit costs are derived from Transco's Essbase unit cost model. This uses costs by LDZ from the general ledger and adjusts for workload statistics captured in MINE.

6.47 We believe that the use of LDZ specific unit costs for Mains and Services is appropriate and will provide a more reflective allocation. However, Transco has been unable to provide supporting calculations for the derivation of the unit costs. In part this is because the calculations were performed during the BPQ process and the supporting files are no longer available.

6.48 We have, therefore, undertaken jointly with an OFGEM technical expert, a review of unit costs to gain an understanding of whether the observed variation in unit costs across regions and asset categories (for example HP versus LP storage) appears reasonable.

6.49 We have established supporting explanations for many of the observed variations and understand the drivers of why variations occur. For example, factors causing variations include labour costs, number of high-rise buildings, density of population and land composition.

66 Source: Deloitte calculation

67 Mains, Services, Storage and LTS Pipe

68 The unit costs were derived by Transco in early 1997 and retrieved during the BPQ process

6.50 However certain anomalies cannot easily be explained by the factors listed above. We have requested explanation for these anomalies from Transco. Transco has provided some high level explanations in response, which have answered some of our queries.

6.51 For example, we asked Transco why the unit cost for Mains in Scotland is high but for Services the unit cost is low. The explanation received from Transco suggests that this anomaly is due to the large number of tenement properties in the Scottish centres of population, served by the gas network. This results in one service pipe running from the Mains to the building and a number of service pipes running within the building. We understand that service pipes have a low replacement cost, as they tend to be short in length and require no digging.

6.52 We note however, that Transco has been unable to provide explanations for all of our requests. Given that we have been unable to confirm the accuracy of the systems that produced the unit costs used in the allocation of RAV, and that there remain unexplained variations in unit costs, we have performed sensitivity analysis to test the allocation of the RAV using different unit costs.

6.53 Specifically, we have examined the impact on the allocation of RAV across LDZs using a constant weighted average unit cost (a relatively extreme scenario)[69]. The impact of this sensitivity analysis is set out in Table 6-9 below.

Asset lives

6.54 The asset lives used by Transco to depreciate each of the asset categories agree to those set out in the MMC report[70]. We have also compared these asset lives with those stated in Transco's 2000 statutory accounts.

6.55 Table 6-8 sets out the asset lives for each of four key asset categories. We note that for Services, the asset life per the MMC report is 35 years, whilst the asset life per the statutory accounts is 55-65 years.

Table 6-8: Asset life (years)[71]

Asset Life (Yrs)	Mains	Services	LTS Pipes[72]	Storage
Per Transco	60	35	48	40
Per MMC	60	35	48	40
Per Transco Statutory accounts	55-65	55-65	-	40

6.56 We have performed sensitivity analysis to understand the impact of using the revised asset life per the statutory accounts on the allocation of the RAV across LDZ's. This is set out in Table 6-9 below.

69 We calculated a weighted average unit cost using the LDZ specific unit costs provided by Transco and applied this to all LDZs

70 See page 169 in MMC report

71 Source: information received from Transco September 2002, Transco Statutory Accounts 2000, MMC Report

72 No asset life for LTS pipes is specified in the 2000 statutory accounts

Land and Building

6.57 Land and Building represents 2% of the aggregate LDZ RAV as at 31 December 1999. From our discussion with Transco we have ascertained that there are around 28,000 Transco property sites, of which 2,500 are referred to as 'Larger Sites' that represent over 80% of the value of total Land and Buildings.

6.58 We understand that in 1998 all larger sites were re-valued individually, and that smaller sites were valued on a sample basis, by FPD Savills. Non-sampled assets were valued by extrapolating the results of the survey. The 1998 valuation formed the basis for allocating Land and Buildings to each LDZ.

6.59 We have obtained the base data to confirm the allocation of assets. We have traced and agreed a sample of the Land and Building assets to the FPD Savills Report in 1998 and note no exceptions.

6.60 We have also reperformed the calculation to determine the percentage of total Land and Buildings value within each LDZ. By reperforming these calculations (allowing for NTS adjustments provided to us by Transco), we identified small differences from the percentages Transco used in their initial allocation model. The impact of using the revised percentages is set out in Table 6-9. Despite the slight inconsistency outlined above, we conclude that using the percentage of total value to allocate the Land and Buildings Target RAV is appropriate.

Key sensitivities in the allocation of the RAV

6.61 In Table 6-9 below we set out the impact of sensitivity analysis discussed in the various sections above on the allocation of the Target RAV across LDZ's. The sensitivities are:

- adjusted scaling process as set out in paragraph 6.33;
- use of a constant average unit cost across LDZ for Mains and Services as set out in paragraph 6.52;
- use of asset lives per statutory accounts for Services as set out in paragraph 6.56; and
- supported Land and Building proportions as set out in paragraph 6.60.

6.62 The table records the impact of each adjustment on Transco's base case.

Table 6-9: Impact on allocation of RAV across the Networks when key assumed inputs are changed (£'m, 1999 Prices)[73]

	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE
Base case	868	1,016	1,012	1,580	685	1,242	874	1,473
Preferred allocation method	0	(5)	3	(3)	1	0	1	3
Std unit cost across LDZ (Mains and Services)	31	100	(15)	10	(28)	6	(79)	(26)
Asset life for Services per Statutory accounts	(22)	(9)	25	(12)	10	(18)	12	15
Supported Land and Buildings %	0	0	0	0.5	(0.5)	0	0	0

6.63 In Table 6-10 below, we set out the combined impact of the sensitivity results outlined above on the percentage of the RAV allocated to each LDZ.

6.64 Combined sensitivity 1 shown in Table 6-10, illustrates the combined impact of correcting computational errors that we have identified. We believe that there is a valid case for making changes for:

- the adjusted scaling process and;
- the supported land and buildings percentage.

6.65 Combined sensitivity 2, includes the impact of using standard unit costs across LDZ's for Mains and Services, as well as the changes included in combined sensitivity 1. We do not think it is appropriate to incorporate changes to asset lives given that they reconcile to the MMC. We also note that we believe the average unit cost scenario is relatively extreme.

73 Source: Deloitte calculation

Table 6-10: Comparison of initial Transco allocation and revised allocation based on combined sensitivities 1 and 2[74]

	SC	N&Y	NW	EE	WM	W&SW	NL	S&SE
Base case	9.9%	11.6%	11.6%	18.1%	7.8%	14.2%	10.0%	16.8%
Combined sensitivity 1	9.9%	11.6%	11.6%	18.0%	7.8%	14.2%	10.0%	16.9%
Combined sensitivity 2	10.3%	12.7%	11.4%	18.1%	7.5%	14.3%	9.1%	16.6%

Conclusions

6.66 The Target RAV for LDZ's in 2000, which is determined by Transco, reconciles to the RAV determined by OFGEM under the current price control. With regard to their methodology of allocating the RAV, we believe that the approach is logically sound. We have found minor computational and consistency errors in Transco's calculations. However, correcting for these two issues leads to an immaterial difference in the allocation of the RAV.

6.67 We have sought to confirm the inputs and assumptions used within Transco's bottom up approach. We have been unable to confirm the accuracy of the systems producing the information on km length of pipe and unit costs and we have not received adequate explanations for some of the variations in unit costs.

6.68 Our sensitivity analysis shows that using an average unit cost for Mains and Services does create a material change in the allocation of the RAV for some LDZs. This is particularly the case in North and Yorkshire, and North London (as set out in Table 6-9). However, we do believe this is a relatively extreme and unsupported scenario.

6.69 Finally, it is also important to put this allocation into context. OFGEM indicates in its Initial Consultation Document[75], that the preliminary estimate of RAV for each LDZ may need to be adjusted or sculpted to eliminate any initial regional variations in consumer gas prices.

74 Source: Deloitte calculation

75 Refer to Paragraph 8.15

7 Demand Forecasting

Introduction

7.1 We have been engaged by OFGEM to perform a high level review of Transco's LDZ demand forecasting methodology.

7.2 Demand forecasts are a key input into the determination of regional network revenues and into Transco's regional charges. We understand that OFGEM has relied on Transco's proposed regional network revenue split, which is based on the May 2001 LDZ demand forecast, to project regional revenues in their Initial Consultation Document[76]. OFGEM needs assurance that Transco's demand forecasting methodology is appropriate for calculating demand at a disaggregated LDZ level.

7.3 We have been engaged by OFGEM to:

- reconcile the forecasts to Transco's Ten Year Statement;
- review Transco's methodology for forecasting regional network demand and to consider its reasonableness;
- establish whether Transco has updated their regional network demand forecasts for 2002/03; and
- consider the impact of the accuracy of forecasts on the split of regional network revenues.

7.4 It should be noted that our scope of work is limited and does not entail a detailed review of Transco's overall forecasting methodology (although we do comment on it at a high-level). In addition our work does not seek to audit or review the validity of Transco's assumptions and calculations.

7.5 We understand that OFGEM has previously gained assurance on the overall methodology. The purpose of this review is to ensure that the overall methodology has been applied appropriately at an individual regional network level.

7.6 In this section we:

- provide an overview of relationship between LDZ demand forecasts and revenue split across LDZs;
- reconcile the sum of disaggregated LDZ annual demand forecasts to the aggregate LDZ annual demand forecast in Transco's Transportation Ten Year Statement;
- set out our understanding of the LDZ demand forecasting methodology and consider its validity;
- provide analysis on the accuracy of previous forecasts;
- consider the impact of forecast accuracy on the split of revenue in 2002/03;

76 Table 8.9 (Forecast transportation charge revenue 2002/03, £ millions)

- present Transco's most recent LDZ demand forecasts for 2002/03 and assess their impact on revenue projections and the allocation of allowed revenues between regional networks; and

- present our conclusions on the LDZ demand forecasting process.

Overview of relationship between LDZ demand forecasts and revenue split

7.7 An outline of Transco's methodology used to calculate the 2002/03 revenue split is presented below:

- An individual regional network's revenue is derived from a LDZ commodity charge, a LDZ capacity charge and a customer charge.

- The LDZ commodity revenue element is the product of the demand forecast for the formula year and unit LDZ commodity revenue charges. The unit LDZ commodity revenue charge varies across load categories, with smaller load categories having a higher unit charge than larger load categories. Unit revenue charges are identical across LDZs for similar loads. There are current variations in the charges seen by customer between LDZs for the full range of loads. This is a result of the different load factors which are observed and applied within LDZs.

- The LDZ capacity element is the product of the supply off take quantities ("SOQ") and unit capacity revenue charges. Through our discussions with Transco we understand that the SOQ is derived from total daily quantities nominated by shippers. We understand that the SOQ used to generate the 2002/03 revenue split are based on 2001/02 tariff year actual figures. This is because SOQ data is only calculated on a tariff year basis (October - September), hence SOQ data on a formula year basis (April - March) is not available[77]. The unit capacity revenue charge varies across load categories, with smaller load categories having a higher unit charge than larger load categories. There is no variation in the unit capacity revenue charge across LDZs for small or large load categories, but local load factors do lead to variations in unit prices across LDZs.

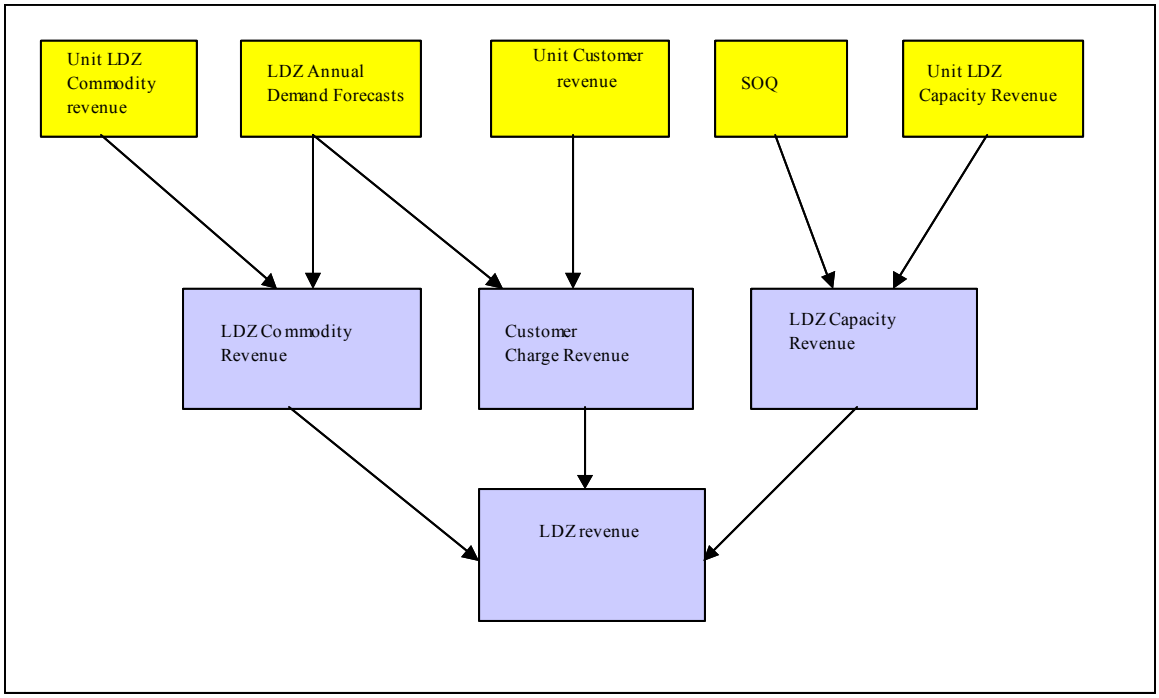
- An element of the customer charge is dependent on the demand forecast and there are no differences in the unit revenue charge constant across LDZs. The customer charge applies to all customers but is volume related for larger loads.

7.8 The split of revenue between LDZs is based of the 2002/03 regional network revenue split submitted to OFGEM. As a result, the split is dependent of demand forecast accuracies.

7.9 The methodology used in calculating LDZ revenue is summarised in Figure 7-1 below:

77 We note that SOQ data for tariff year 2001/02 will cover the first 6 months of the 2002/03 formula year

Figure 7-1: Summary of LDZ revenue methodology



Reconciliation of individual LDZ demand forecasts to Ten Year Statement

7.10 We understand that the 2002/03 revenue split submitted to OFGEM is based on Transco's May 2001 demand forecasts. To ensure consistency between the results of individual LDZ demand forecasts and aggregate LDZ demand forecasts, we reconciled the sum of the individual LDZ forecasts of May 2001 to the aggregate LDZ demand forecast included in Transco's 2001 Transportation Ten Year Statement.

7.11 For each of the calendar years, 2002 and 2003, the sum of the individual LDZ annual demand forecast was compared to the aggregate LDZ annual demand in the Ten Year Statement. For both years the sum of the individual LDZ annual demand forecasts agreed to the Ten Year Statement.

7.12 The individual 2002/03 LDZ peak demand forecasts of May 2001 agreed to the individual LDZ peak demand forecasts in the 2001 Transportation Ten Year Statement. Appendix 4 sets out a reconciliation between the May 2001 forecasts and the Ten Year Statement.

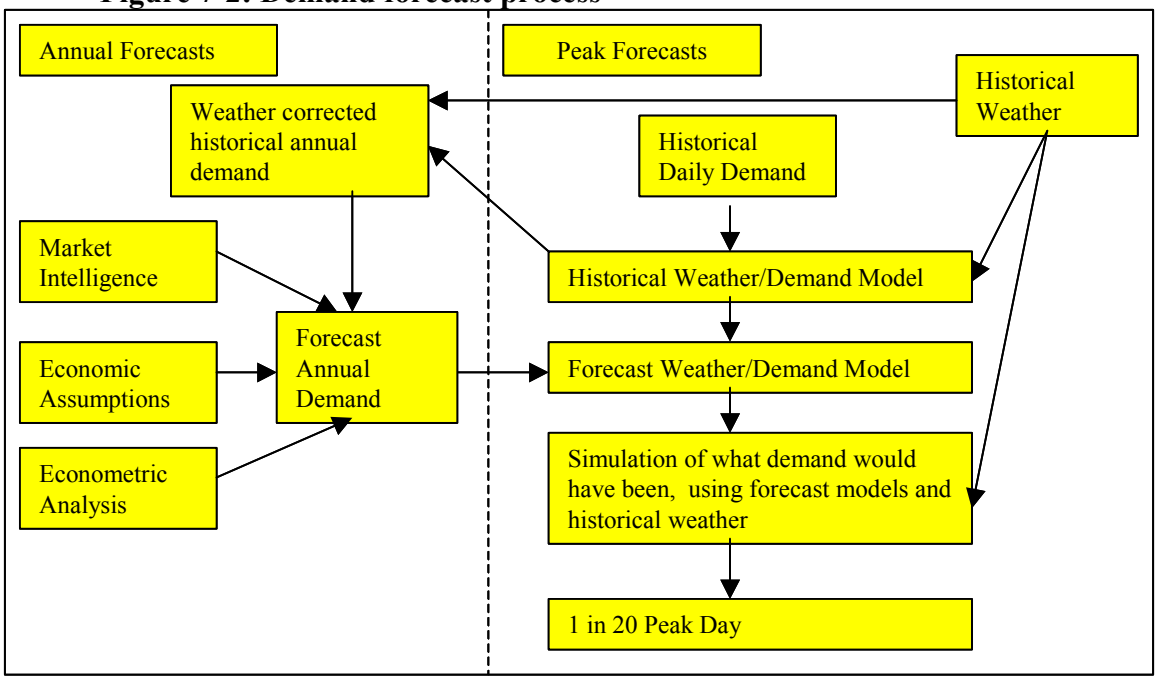
Overview of demand forecast process

7.13 Transco appears to have a comprehensive demand forecasting process that is based upon a methodology utilised by British Gas. The methodology is described in Transco's document titled "Demand Forecasting Methodology" dated July 2000. We understand that although, in 2001 a small number of changes were introduced to enhance the process and that in addition, the process was renamed as the "Transporting Britain's Energy" consultation process.

7.14 The process entails developing forecasts of annual demand using market intelligence, economic assumptions, econometric analysis and weather corrected historical annual demand. This annual demand is then used, along with historical weather data, to produce peak daily demand forecast profiles.

7.15 The overall process is summarised in **Figure 7-2** below.

Figure 7-2: Demand forecast process



7.16 We have reviewed the methodology, and believe that Transco adopts a robust approach. The process can be outlined as follows:

- The process incorporates planning assumptions such as economic factors, government policy/taxes, supply point, new connections and fuel prices. The basis of these assumptions are sourced from commercially available information or subscribed from reputable specialist organisations such as Business Strategies Ltd and Cambridge Econometrics.

- Where relevant, information specific to individual LDZs is gathered, for example supply points forecasts and establishment or closure of large loads. This enables individual LDZ specific characteristics and data to be input in the demand forecast econometric model.

- Once annual demand forecasts and daily demand/weather models have been developed, peak day demands are calculated for each LDZ from simulated daily demands. This involves generating sets of simulated daily demands based on historical weather data. The peak daily demands from each simulation are fitted to a statistical distribution enabling the peak demand at the desired level of probability to be determined.

- At the beginning of each forecasting cycle Transco provides an opportunity for interested parties to comment on its planning assumptions including economic and fuel price assumptions, LDZ demand forecasts and demand sensitivities. Such information is set out in the previous years Ten Year Statement.

- Transco visits a number of the major companies, including producers, shippers and end consumers to give detailed presentations on Transco's forecasts and to discuss the issues raised in the previous years Ten Year Statement.

- The culmination of the forecast process is the annual publication of the Ten Year Statement for the current year, which provides volume forecasts, system reinforcement projects and investment plans.

- Transco review their forecast accuracy on an annual basis (comparing forecast and weather corrected actual quantities) in an effort to improve the forecasting process and to highlight assumptions, which may need to be re-addressed in future demand forecasts.

7.17 We note that the demand forecasting process is a bottom up approach with planning assumptions and input data sourced on an individual LDZ basis, where appropriate. The methodology, therefore, produces demand forecasts at a disaggregated LDZ level.

Validity of methodology

7.18 OFGEM needs assurance that Transco's demand forecasting methodology is appropriate for calculating demand at a disaggregated LDZ level. This section sets out our assessment of the validity of Transco's LDZ demand forecasting methodology. This assessment is based on our understanding of the demand forecasting process and also on the findings of other third parties who have previously reviewed the demand forecasting process.

7.19 Transco's LDZ demand forecasting methodology appears to be comprehensive and incorporates economic assumptions and market intelligence, sourced from reputable specialists. A key feature of the demand forecasting process is that these assumptions are validated through a public consultation process.

7.20 The Transporting Britain's Energy consultation process provides a framework for Transco to share its views on the factors underpinning their future LDZ demand forecasts with producers, shippers and end user customers. The consultation process operates as a two way process and Transco welcomes feedback on its planning assumptions and forecasts. The feedback from the Transporting Britain's Energy process is then used in the generation of the demand forecasts included in the Ten Year Statement.

7.21 Transco also reviews LDZ forecast accuracy on both an aggregate and individual LDZ basis. One year ahead, three year ahead and five year ahead forecast inaccuracies are determined on an aggregate basis. Additionally, one year ahead forecast inaccuracies are computed on an individual LDZ basis.

7.22 Having determined the one year ahead forecast inaccuracy on an individual LDZ basis, Transco carries out a "Forecast Trace" for each LDZ which identifies the primary causes of differences between forecast demand and actual demand (adjusted for average weather conditions). The Forecast Trace highlights assumptions or base data which can be revised when preparing future demand forecasts. This acts as a feedback mechanism to identify specific reasons for forecast inaccuracies. For example, the mechanism might adjust for off takes from the NTS that where previously assumed to be from the LDZ. This ensures that forecasts are continually refined and updated.

7.23 It is also important to note that independent consultants have reviewed the demand forecasting methodology. For example in the Transco Price Control Review 2002-2007[78], Mazar Neville Russell states *"With regard to Transco's demand projections and its methodology, the basis and assumptions for the Baseline case are considered reasonable except that deeper analysis of price impact on demand could have been undertaken".*

78 Paragraph 3.12 of MNR report on Transco Price Control Review 2002-2007

7.24 Transco also recently commissioned Mott MacDonald to perform an independent audit of the methods and assumptions associated with the production of a suite of gas supply and demand matrices used to demonstrate the NTS entry capacity. The Mott MacDonald report concluded in section 1.2.1 that *"In particular, we have not identified and changes to Transco's practices which we believe would make a material improvement to the accuracy of their forecasts. In general, we find Transco's demand forecasting process to be comprehensive and to utilise sound techniques".*

7.25 In summary, Transco's LDZ demand forecasting process is a bottom up approach using specific information gathered for individual LDZs, where relevant. External inputs and assumptions are sourced from specialists leading to high quality data. Transco revisit their forecasts and compare to actual demand to highlight assumptions or base data that were incorrect. The demand forecasting process has been validated by two external reviews.

7.26 Overall the LDZ demand forecasting process is based on sound approach and appears to be comprehensive. However, we have not reviewed in detail the specification of the demand forecasting models or performed any checks on the data used in the models.

Forecast demand errors

7.27 Transco analyses demand forecast accuracy on an aggregate LDZ basis for one-year ahead, three-year ahead and five-year ahead forecasts. Demand forecast inaccuracy is calculated for both annual demand and peak demand.

7.28 The average absolute errors for annual demand forecasts and peak demand forecasts are shown in Table 7-1 below. The figures in brackets are the numbers of years of forecasts incorporated in the average accuracy error.

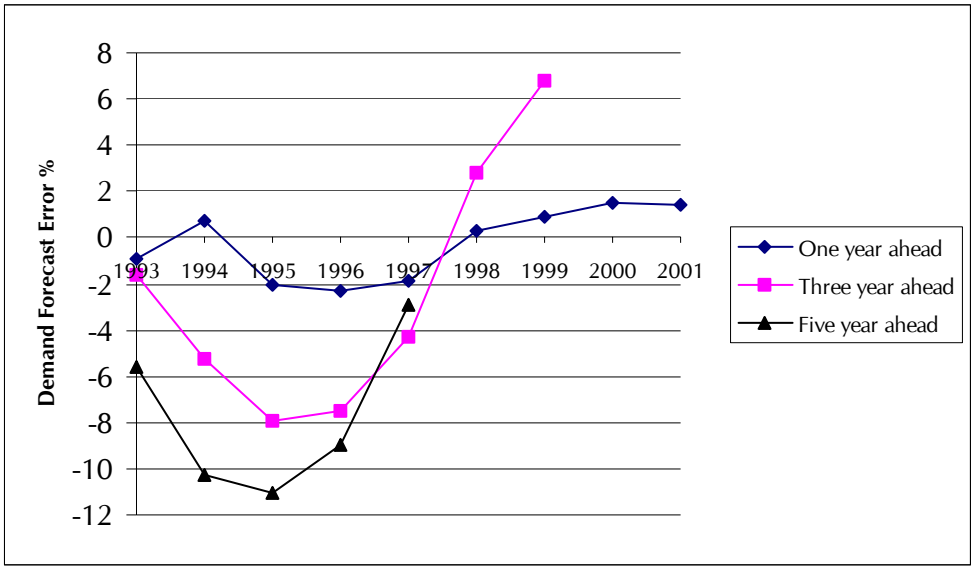
Table 7-1: Annual and peak demand forecast accuracy[79]

Forecast	Annual Error	Peak Error
One year Ahead	1.3% (9 years)	1.2% (9 years)
Three Years Ahead	5.1% (7 years)	2.0% (7 years)
Five Years Ahead	7.8% (5 years)	2.7% (5 years)

7.29 Actual annual demand errors are shown in Figure 7-3.

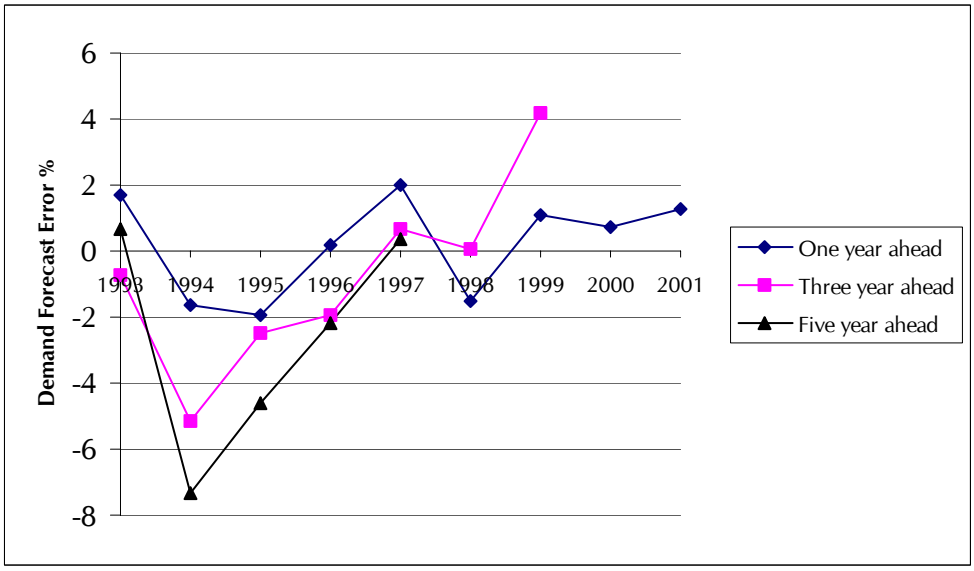
79 Demand forecasts are compared to the actual demand which has been adjusted for average weather conditions, source: Data received from Transco on 16 October 2002

Figure 7-3: Annual demand error



7.30 Actual peak demand errors are shown in Figure 7-4.

Figure 7-4: Peak demand error



7.31 As would be expected, in general, the one-year ahead forecast is more accurate than either the three-year ahead or the five-year ahead forecasts. In general the accuracy of peak demand is higher than the accuracy of annual demand.

7.32 However care should be taken when comparing the accuracy of peak and annual forecasts, as interruptible loads are included in annual forecasts but excluded from peak demand forecasts. As explained below, interruptible loads have the largest demand forecast accuracy errors. This may explain why the accuracy of peak demand is higher than annual demand.

7.33 For management purposes, Transco reviews demand forecast accuracy at an individual LDZ level based in one-year ahead forecasts only. We understand that this is driven by the lead-time required for most LDZ projects, which is typically one year. Hence five-year ahead reviews of demand forecast accuracy at an individual LDZ level are not readily available.

7.34 The accuracy of demand forecasts on an individual LDZ level shows that the one-year ahead forecasting accuracy between the LDZs varies more significantly. Transco has provided one-year ahead annual demand forecasts compared to actual demand on a disaggregated basis for the period 1998 to 2001. A summary of results is provided in Table 7-2 below (full details, by LDZ, are provided in Appendix 5).

Table 7-2: Annual demand forecast accuracy across LDZs[80]

LDZ	Absolute average error (4 years)	Range of errors for period 1998 - 2001
Scotland	1.8%	-3.9% to 1.7%
Northern	3.1%	-1.0% to 6.6%
North West	1.2%	0.5% to 2.8%
North East	1.3%	-0.9% to 2.2%
East Midlands	1.2%	-0.1% to 3.5%
West Midlands	1.5%	0.4% to 2.6%
Wales	4.8%	-5.2% to 6.8%
Eastern	2.1%	-1.8% to 2.6%
North Thames	0.6%	-0.8% to 0.7%
South East	0.7%	0.2% to 1.1%
Southern	1.2%	-0.7% to 2.0%
South West	2.3%	0.4% to 5.4%

7.35 In addition to this analysis we have also requested five year forecast data by individual LDZ for the period ending in 2000. The results are shown in Table 7-3 below.

80 Source: Deloitte & Touche calculations

Table 7-3: Absolute average error of five year ahead demand forecasts (2000 and 2001)[81]

LDZ	Absolute average error (2 years)
Scotland	10.1%
Northern	5.6%
North West	2.3%
North East	5.9%
East Midlands	6.8%
West Midlands	3.3%
Wales	23.9%
Eastern	5.6%
North Thames	3.8%
South East	7.3%
Southern	8.3%
South West	5.8%

7.36 The results show that the individual LDZ average absolute error for the five year forecast is higher than for the one year forecast. This is to be expected and is due to the increased time span, which introduces greater uncertainty in the accuracy of the planning assumptions, such as growth or economic assumptions.

Demand forecast accuracy and load categories

7.37 The revenue calculation for each LDZ considers demand by load category. We understand that the unit LDZ commodity revenue charge varies across different load categories. Smaller load categories, for example, have a higher unit revenue charge than larger load categories. The result of this is that smaller load categories will have a greater weighting in the revenue calculation. As a result, forecast accuracy by load category needs to be considered.

7.38 At a high level, Transco reviews forecast accuracy by the following load categories:

- total firm (comprising total non daily metered ("NDM") and daily metered ("DM") firm); and
- interruptible.

7.39 A summary of the average absolute forecast accuracy at an aggregate LDZ level for each load category is shown in Table 7-4 below. The figures in brackets are the numbers of years of forecasts incorporated in the average accuracy error.

81 Source: Data received from Transco on 29 October 2002

Table 7-4: Demand forecast error by load category[82]

Load category	One year forecast error	Five year forecast error
Firm	0.7% (4 years)	4.1% (2 years)
Interruptible	6.8% (4 years)	14.3% (2 years)
Total LDZ	1.1% (4 years)	4.5% (2 years)

7.40 For both the one year ahead and five year results the forecast accuracy of Firm loads is significantly better than the forecast accuracy of Interruptible loads. This is a consistent result across all the LDZs. This observation is in line with our expectations, justifications for which are provided below.

7.41 We understand that the Interruptible and DM Firm load categories are comprised of a small number of large consuming loads in each LDZ. Therefore this can result in an over or under forecast for a single load having a significant affect on the forecast accuracy. As these under or over forecasts are specific to individual LDZs it can lead to significant variations when comparing the demand forecast accuracy across LDZs.

7.42 Forecast demand is based on information received from end users on how they intend to operate. It might be that end users change their plans and hence the forecast can be inaccurate. Rationalisation or technical problems are two reasons why end users may alter their demand profiles.

7.43 The NDM accounts for most of the Total Firm load has a higher forecast accuracy than Interruptible loads. The average absolute NDM forecast error across LDZs is generally consistent.

7.44 We understand LDZ NDM forecast accuracy errors arise due to a number of factors, such as an enforced change in a weather station. This gives rise to associated weather sensitivities. Alternatively errors can be due to the daily demand attribution process, which pre October 2002 was based on Seasonal Normal Demand (SND) forecasts at an LDZ level (i.e both NDM and DM), which could distort allocations if DM loads consumed less or more than was forecast.

Impact of forecast errors and the price control

7.45 OFGEM's Final Proposals indicate that LDZ revenues will be calculated on the basis that 65% of allowed revenues are fixed and 35% of allowed revenues vary with the quantity of gas transported. The LDZ price control formula does not use the actual quantity of gas transported but a composite quantity.

7.46 The composite quantity is calculated by classifying loads as small user quantity, large user quantity or very large user quantity. A different weighting to each user category. A 100% weighting is assigned to small users, 15% to large users and 5% to very large users.

7.47 We understand that OFGEM is concerned about regional price variations. It might be important, therefore, to model the impact of demand forecast errors over the price control period. This work is outside the scope of this engagement. However, in this section we do consider how demand-forecasting errors impact the composite demand calculation.

82 Source: Deloitte & Touche calculations

7.48 Our analysis is based on one-year demand forecast errors, given that the latest demand forecasts will be used to allocate allowable price control revenues next year.

7.49 Transco has not historically categorised loads as small, large or very large. Instead they categorise loads as Firm and Interruptible, with Firm loads further analysed into Total NDM and DM Firm. Whilst it may be possible to map the Firm and Interruptible load categories to small, large and very large user categories we understand that it would require extensive resources and analysis from Transco. Given time constraints it was decided to simplify the analysis. Through our discussions with Transco we have adopted the methodology described below.

- the Small User category, which is the main revenue driver, has been approximated by using the Total NDM measure;
- where load categories are analysed into only Firm (no further split into Total NDM and DM Firm) and Interruptible, a uniform percentage of Firm load was applied across all LDZs and assumed to approximate to DM Firm; and
- it was then assumed that the sum of DM Firm and Interruptible loads were equivalent to the sum of large and very large users.

7.50 To calculate a composite quantity demand forecast, weightings of 100%, 15% and 5% are applied to the small, large and very large user categories. Whilst our simplified analysis identifies small users, the large and very large users are aggregated. Therefore a weighting for the combined large and very large user categories was required.

7.51 OFGEM's Final Proposals[83] provides assumptions on the magnitude of large and very large user categories in each of the years in the price control period. A combined weighting can be calculated from this. The average result over the 5 years is 13.1%, which is assigned to DM firm and Interruptible forecasts to enable a composite demand to be calculated.

7.52 The table below calculates the average weighted error in the composite demand forecast. The figures in brackets are the numbers of forecasts incorporated in the average accuracy error.

83 Page 117 of OFGEM's Final Proposals

Table 7-5: Composite forecast demand error[84]

LDZ	Forecast Demand	Composite Forecast Error
Scotland	1.8% (4 years)	1.9% (4 years)
Northern	3.1% (4 years)	1.3% (4 years)
North West	1.2% (4 years)	1.2% (4 years)
North East	1.3% (4 years)	1.6% (4 years)
East Midlands	1.2% (4 years)	1.2% (4 years)
West Midlands	1.5% (4 years)	1.2% (4 years)
Wales	4.8% (4 years)	3.7% (4 years)
Eastern	2.1% (4 years)	2.3% (4 years)
North Thames	0.6% (4 years)	1.0% (4 years)
South East	0.7% (4 years)	0.9% (4 years)
Southern	1.2% (4 years)	1.0% (4 years)
South West	2.3% (4 years)	1.2% (4 years)

7.53 For seven out of the twelve LDZs the composite demand forecast accuracy error is less than or equal to the actual demand forecast accuracy error. It might be expected that the composite quantity demand accuracy errors across all the LDZs would be lower than the actual demand forecast accuracy error.

7.54 However, there are some instances where an under forecast in the small user category and an over forecast of large and very large users net off, or vice versa. After applying the composite weightings the net over and under composite forecast increases and hence the composite demand forecast inaccuracy increases.

7.55 It is interesting to note that the variance in the forecast error decreases. Actual forecast errors are in the range 0.6% to 4.8%, whilst the range of the composite demand forecast errors have a narrower range between 0.9% and 3.7%.

Forecast demand accuracy of May 2001 demand forecasts

7.56 We understand that the 2002/03 revenue forecast by regional network, as provided by Transco for inclusion in Table 8.9 of OFGEM's Initial Consultation Document is based on 2002/03 LDZ demand forecasts prepared in May 2001.

7.57 In considering the impact of demand forecast accuracy on calculating the revenue split in 2002/03 we believe that it is appropriate to apply the results obtained from the one-year error analysis. This analysis is performed in the next section.

84 Source: Deloitte & Touche calculations

Implications of demand forecast errors on 2002/03 revenue split

7.58 An outline of the methodology used by Transco to calculate the revenue split across regional networks was described at the beginning of this section. The main elements of total LDZ revenue are the LDZ commodity, LDZ capacity and customer commodity charges.

7.59 Table 7-6 below analyses the percentage make-up of each LDZ's revenue into the main three revenue categories.

Table 7-6: Analysis of LDZ revenue[85]

LDZ	LDZ Commodity Charge	LDZ Capacity Charge	Customer Charge	Other	Total
Scotland	37.8%	32.5%	28.8%	1.0%	100%
Northern	35.4%	35.1%	28.6%	0.9%	100%
North West	37.0%	33.1%	29.0%	0.9%	100%
North East	37.6%	33.0%	28.4%	1.0%	100%
East Midlands	37.3%	33.7%	28.0%	1.0%	100%
West Midlands	35.5%	36.6%	26.8%	1.1%	100%
Wales	36.8%	34.7%	27.4%	1.1%	100%
Eastern	35.0%	34.8%	29.4%	0.8%	100%
North Thames	35.3%	35.6%	28.1%	0.9%	100%
South East	34.5%	35.8%	29.0%	0.7%	100%
Southern	33.3%	38.5%	27.3%	0.9%	100%
South West	35.1%	36.6%	27.5%	0.9%	100%

7.60 LDZ commodity revenue and customer commodity revenue are driven by the individual LDZ demand forecasts. This accounts for a high proportion of the total revenue. Consequently any forecast errors in the LDZ demand forecast will impact the split of revenue.

7.61 The LDZ capacity charge accounts for between 32.5% and 38.5%. This element is calculated based on SOQ data and not demand forecasts. This element of the revenue calculation will not be subject to demand errors associated with the LDZ demand forecasting process and will dampen the impact of errors on the revenue split.

7.62 The impact of demand forecast accuracy errors is further dampened due to differences in the unit LDZ commodity revenue charges between load categories. Unit revenue charges are higher for smaller load categories than for larger load categories. In the revenue calculation there is a greater weighting on smaller loads, which have a higher unit cost, and better forecasting accuracy.

85 Source: Deloitte & Touche calculations

7.63 The impact of LDZ demand forecast accuracy errors on the 2002/03 regional network revenue split are outlined towards the end of this section.

Comparison of demand forecasts used in revenue split to latest demand forecast

7.64 OFGEM's initial conclusions where based on forecasts provided in May 2001. Transco's most recent disaggregated LDZ demand forecasts were prepared in May 2002 for inclusion in the 2002 Transportation Ten Year Statement. These forecasts are compared in the table below:

Table 7-7: Comparison of May 2001 and May 2002 forecasts[86]

LDZ	May 2001 Forecasts		May 2002 Forecasts	
	2002/03 Annual Demand (TWh)	2002/03 Peak Demand (GWh/day)	2002/03 Annual Demand (TWh)	2002/03 Peak Demand (GWh/ day)
Scotland	64	343	66	345
Northern	44	265	44	260
North West	93	538	91	529
North East	51	279	49	277
East Midlands	85	464	80	451
West Midlands	66	454	65	456
Wales	47	249	44	237
Eastern	54	359	52	350
North Thames	76	508	74	498
South East	79	516	77	509
Southern	50	380	48	373
South West	41	279	39	272

7.65 To quantify the impact of the latest LDZ demand forecasts on the regional network revenue split, we have flowed the May 2002 forecasts through Transco's revenue/postalisation model. We note that this analysis does not take into consideration the potential impact of the latest forecasts has on the pricing structure in the model. It is simply used to produce a revised revenue allocation.

7.66 The results of flowing the May 2002 demand forecasts through Transco's revenue model are presented in Table 7-8 below:

86 Source: Data received from Transco on 6 November 2002

Table 7-8: Forecast regional network revenue split based on May 2002 demand forecasts[87]

Regional network	% Revenue allocation[88]	Allowable revenue per Ofgem[89]	Revised % revenue allocation	Revised revenue split - £'m	Variance to OFGEM[90] - £m
Scotland	8.0%	158	8.2%	162	4
N & Yorks	11.9%	235	11.8%	233	(2)
North West	12.4%	244	12.4%	244	0
East England	18.1%	356	17.9%	354	(2)
West Midlands	9.1%	179	9.2%	182	3
Wales & SW	10.8%	214	10.6%	209	(5)
North London	11.1%	218	11.1%	219	1
South & SE	18.6%	366	18.7%	367	1
Total	100.0%	1,970	100.0%	1,970	0

7.67 We note that the latest forecasts do change the allocation of revenue between regional networks. OFGEM should consider whether they believe this change to be material.

Impact of One Year Ahead Demand Forecast Errors on May 2002 LDZ Demand Forecasts

7.68 The impact of one-year ahead forecast errors on the 2002/03 revenue split have also been evaluated by applying the 2000 forecast errors, on an individual LDZ basis and for all load categories, to the May 2002 forecasts. The results of this analysis have been incorporated into Transco's revenue model to assess the impact on the revenue split.

7.69 Table 7-9 shows the results of the analysis and also comparison to the revenue split in OFGEM's Initial Consultation Document.

87 Source: Deloitte & Touche calculations using Transco's revenue model

88 Source: Table 8.9, Initial Consultation Document

89 Source: Table 8.9, Initial Consultation Document

90 Initial Consultation Document, Table 8.9 Forecast transportation charge revenue 2002/03 (£ millions)

Table 7-9: Forecast regional network revenue split based on May 2002 demand forecasts and individual LDZ forecast errors[91]

Regional network	% Revenue allocation	Allowable revenue - £'m	Variance to OFGEM[92] - £'m	Variance to OFGEM's - %
Scotland	8.3%	163	5	3.3%
N & Yorks	11.9%	234	(1)	-0.4%
North West	12.3%	242	(2)	-0.8%
East England	18.0%	355	(1)	-0.3%
West Midlands	9.3%	183	4	2.1%
Wales & SW	10.7%	210	(4)	-1.6%
North London	11.0%	217	(1)	-0.5%
South & SE	18.5%	365	(1)	-0.2%
Total	100.0%	1,970	0	

7.70 Comparison of Table 7-8 and Table 7-9 indicate that the impact of the LDZ demand errors on the regional network revenue split appears not to be substantial.

7.71 The impact of demand errors on the revenue split is dampened due to the following:

- only the LDZ commodity revenue and customer commodity revenue is dependant on demand forecasts; and
- smaller load categories have higher forecast accuracies than larger load categories. As unit revenue charge for smaller load categories is higher there is an increased weighting on the smaller load forecasts.

Conclusion

7.72 Overall the LDZ demand forecasting process is based on a sound approach and appears to be comprehensive. Common with any forecasting process, Transco's process whilst appearing comprehensive and utilising sound approach will inevitably be subject to forecast inaccuracies. The impact of using the latest demand forecasts (i.e. May 2002) and the impact of demand inaccuracies are highlighted above in Table 7-8 and Table 7-9. OFGEM should consider whether they believe this change as material.

91 Source: Deloitte & Touche calculations using Transco's revenue model

92 Table 8.9 Forecast transportation charge revenue 2002/03 (£ millions)

Appendix 1: Information sources

7.73 For the purposes of this report, we have relied upon, inter alia, the following information:

- OFGEM's Initial Consultation Document entitled " Separation of Transco's distribution price control, Initial Consultation document, July 2002";
- certain information provided by Transco to OFGEM in September 2002;
- responses to over 88 questions submitted to Transco in the period 2 October 2002 to 24 October 2002 (as set out in Exhibit 1);
- information provided in meetings with Transco personnel on 16 October 2002 in relation to Transaction Model and demand forecasting;
- Transco's response to the Deloitte Draft Report dated 8 November 2002;
- OFGEM Final proposals document entitled "Review of Transco's price control from 2002, Final proposals, September 2001";
- the Andersen final report, which is referred to in OFGEM's Final proposal document;
- the MNR draft and final reports;
- a report by the Monopolies and Mergers Commission entitled "A report under the Gas Act 1986 on the restriction of prices for gas transportation and storage services";
- Transco's Business Plan Questionnaire submitted to OFGEM on 18 December 2000;
- Transco's response to supplementary question's submitted as part of the BPQ;
- KPMG Summary Report, "BG Transco Activity Based Costing Review", 8 August 2000;
- Transco's regulatory accounts 2000 and statutory accounts 2000;
- electronic files containing the Transaction Model allocation rules and other inputs and the output results, received in October 2002;
- Transco's demand forecasting methodology entitled "Demand Forecasting Methodology, July 2000";
- presentation material on Demand Forecasting provided by Transco to Deloitte on 16 October;
- the Mott Mcdonald Report on Demand Forecasting entitled " Ofgem Matrices – Validity of Transco Development Process, Independent Audit Report, 27 July 2001;
- Transco's Transportation 10 year Statement 2000; and
- discussions with OFGEM's engineering experts.

Appendix 2: DETAILS OF COST DRIVER CHANGES MADE TO REPLICA TRANSACTION MODEL

Step 1 - correcting drivers which have been changed since 2000					
TM_Product	**Cost (£'m)**	**Description**	**Category**	**2000 Rule**	**Step 1 (2002 correction)**
00SUP-P002	9.3	Procurement & Logistics	C	Evenly	RNR-MATERIALS-COST
00REG-P002	7.1	Licence Fee	C	Evenly	Supply Points
00REG-P003	4.9	Other Regulations	C	Evenly	Supply Points
00TIT-P070	4.6	Telecoms - PMR	B	Evenly	LDZ-IND-FTE
00SYS-P009	1.9	Demand Forecasting for LDZ	B	Evenly	LDZ-DEMAND-4CAST
00TIT-P027	1.9	STORMS	B	Length of Distribution Mains	RNR-INDUSTRIAL-AND-CONTRACTOR-COST
00OCD-P001	1.0	Gas Demand Forecasting	C	Evenly	LDZ-DEMAND-4CAST
00REG-P001	0.9	Network Code & Pricing	C	Evenly	Supply Points
00TIT-P055	0.3	Essbase	C	Evenly	FTE (Inc Staff and Agency)
00TIT-P054	0.1	Creditor Payments (CPS3)	C	Evenly	FTE (Inc Staff and Agency)
	32.0				

Step 2 - correcting drivers for which we and Ofgem believe there is a better driver						
TM_Product	**Cost (£'m)**	**Description**	**Category**	**2000 Rule**	**Step 2 (better driver)**	**Rationale**
00LTO-P001	26.3	Engineering Services R&D	C	Evenly	Length of Total Mains	The recharge from Avantica mainly relates to Development cost, rather than pure research so size related
00OPC-P001	14.9	Ops Centre Functions	C	FTE (Inc Staff and Agency)	Length of Total Mains	Costs of consolidating OPS assets management information of which the majority are mains
00LDC-P001	13.9	LDZ Centre Functions	C	FTE (Inc Staff and Agency)	Supply Points	Costs of co-ordinating LDZ management information, size related
00SUP-P003	5.5	Learning & Development	C	FTE (Inc Staff and Agency)	FTE (inc Staff, Industrial and Agency)	Industrial staff attend training captured within this cost
00CNC-P001	4.8	Connections Centre Functions	B	Evenly	Supply Points	Costs associated with separation of connections business, size related driver required
00SUP-P004	3.0	Operational Human Resources	C	FTE (Inc Staff and Agency)	FTE (inc Staff, Industrial and Agency)	HR support industrial staff aswell as office/ agency
00SYS-P015	2.2	Operational Systems Development and Support (LDZ)	B	Evenly	Length of Total Mains	Primarily development IT systems for distribution systems, which willl vary with size of existing system
00OCD-P006	1.4	Exec. Human Resources	C	FTE (Inc Staff and Agency)	FTE (inc Staff, Industrial and Agency)	HR support industrial staff as well as office/ agency
00LTO-P005	0.3	Service Standards	C	Evenly	Supply Points	Use same driver as for Licence Fee
	72.3					

Step 3 - using an alternative driver where no clear driver exists						
TM_Product	**Cost (£'m)**	**Description**	**Category**	**2000 Rule**	**Step 3 (alternative driver for shared costs)**	**Rationale**
00COR-P001	41.4	Corporate Recharge	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Relates to Head Office functions, Treasury Group etc. Not staff e.g pensions related. Shared Cost
00SUP-P001	21.4	Finance	C	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost - relates to insurance claims and premiums, creditor payments terms, and the payroll team
00TIT-P016	13.7	LDZ - Miscellaneous	C	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost – costs associated with 'other' (small ad hoc) LDZ systems which are not specifically identified as part of the full TIT systems list.
00OCD-P010	3.8	ExCom	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Directors' costs. Shared.
00TIT-P049	3.7	ServiceCo - Misc	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	IT systems costs. Shared.
00OCD-P003	3.7	Strategy	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost
00OCD-P002	3.5	Other Planning & Finance	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost
00TIT-P072	2.8	Telecoms communications towers for LDZ (90%)	B	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	Ideal would be number of towers however this is not collected.
00LTO-P002	2.1	Property & Governance	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Refers to maintenance of office buildings.
00OCD-P005	1.9	Other Legal	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost
00TIT-P063	1.9	Create Data Policy for LDZ (60%)	B	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost

Alternative 3 Continued						
	Cost (£'m)	**Description**	**Category**	**2000 Rule**	**Alt 3 (alternative driver for shared costs)**	**Rationale**
00TIT-P057	1.4	Financial System (SAP/TDB/TMBS)	C	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	IT systems costs. Shared.
00OCD-P004	1.3	Legal in LDZ	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost
00TIT-P065	1.3	IS Strategy & governance for LDZ (70%)	B	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost
00SPG-P011	1.2	BPD informed buyer for LDZ	B	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	No longer in use, little information available as to nature of cost
00OCD-P007	1.1	Consumer Affairs	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Ideally number of customers but data not available. Size related driver.
00OCD-P008	0.9	Affordable Warmth	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Ideally number of customers but data not available. Size related driver.
00SPG-P009	0.8	BPD internal training for shipper for LDZ	B	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	No longer in use, little information available as to nature of cost
00CPM-P008	0.6	Chadwick Property Costs NOT CPM	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Lack of information on which LDZ uses building so no basis to allocate it on a more specific driver[93]
00TIT-P060	0.5	THESIS	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	IT systems costs. Shared.
00MRS-P005	0.3	Shirley Property Costs to be charged out	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Lack of information on which LDZ uses building so no basis to allocate it on a more specific driver[94]

[93] Transco has stated that information on the shared occupiers of Chadwick House was available and was used as a driver. We are unable to confirm this with the rules of the 2000 Transaction Model

[94] Transco has stated that information on the shared occupiers of the Shirley site is available and has been used as a driver. Whilst we agree this information was used to allocate the cost to Directorates (for example support services and other central departments), no such information was used to allocates the cost across LDZ's. This was done on the basis of FTEs and evenly

Alternative 3 - Continued						
	Cost (£'m)	**Description**	**Category**	**2000 Rule**	**Alt 3 (alternative driver for shared costs)**	**Rationale**
00LTO-P004	0.2	Business Continuity	C	FTE (Inc Staff and Agency)	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost
00TIT-P058	0.0	Hyper ABC	C	Evenly	Equi-proportional/ Throughput/ FTE (alternative)	Shared Cost
	111.1					

Appendix 3: rOLL FORWARD OF RAV by network from 1 jANUARY 2001 TO 31 March 2002 (£'m, 2000 pRICES)[95]

Scotland	1 January 2001 to 31 December 2001	1 January 2002 to 31 March 2002
Opening RAV	890	895
Net additions	41	15
Depreciation	(36)	(8)
Closing RAV	895	902

North & Yorkshire	1 January 2001 to 31 December 2001	1 January 2002 to 31 March 2002
Opening RAV	1,061	1,091
Net additions	85	26
Depreciation	(54)	(12)
Closing RAV	1,091	1,104

North West	1 January 2001 to 31 December 2001	1 January 2002 to 31 March 2002
Opening RAV	1,034	1,075
Net additions	88	17
Depreciation	(47)	(11)
Closing RAV	1,075	1,082

East England	1 January 2001 to 31 December 2001	1 January 2002 to 31 March 2002
Opening RAV	1,622	1,631
Net additions	78	25
Depreciation	(69)	(16)
Closing RAV	1,631	1,640

95 Source: Information received from Transco in September 2002

West Midlands	**1 January 2001 to 31 December 2001**	**1 January 2002 to 31 March 2002**
Opening RAV	711	731
Net additions	57	25
Depreciation	(37)	(9)
Closing RAV	731	747

Wales & South West	**1 January 2001 to 31 December 2001**	**1 January 2002 to 31 March 2002**
Opening RAV	1,294	1,346
Net additions	109	21
Depreciation	(57)	(13)
Closing RAV	1,346	1,354

North London	**1 January 2001 to 31 December 2001**	**1 January 2002 to 31 March 2002**
Opening RAV	909	932
Net additions	62	20
Depreciation	(39)	(9)
Closing RAV	932	943

South & South East	**1 January 2001 to 31 December 2001**	**1 January 2002 to 31 March 2002**
Opening RAV	1,526	1,594
Net additions	138	26
Depreciation	(70)	(17)
Closing RAV	1,594	1,603

LDZ Aggregate	**1 January 2001 to 31 December 2001**	**1 January 2002 to 31 March 2002**
Opening RAV	9,047	9,297
Net additions	659	175
Depreciation	(409)	(95)
Closing RAV	9297	9,376

Appendix 4: rECONCILIATION OF TRANSCo'S MAY 2001 DEMAND FORECAST TO TRANSPORTATION TEN YEAR STATEMENT 2001

Table 2: Peak Demand

	May 2001 Forecast 02/03	Transportation Ten Year Statement 2001 02/03
Scotland	343	343
Northern	265	265
North West	538	538
North East	279	279
East Midlands	464	464
West Midlands	454	454
Wales	249	249
Eastern	359	359
North London	508	508
South East	516	516
Southern	380	380
South West	279	279
LDZ Total	**4,634**	**4,634**

Table 3: Annual Demand

	May 2001 Forecast (Aggregate of LDZs)		Transportation Ten Year Statement 2001	
	2002	**2003**	**2002**	**2003**
0-73 MWh	403	408	403	408
73-732 MWh	64	65	64	65
>732 MWh	133	138	133	138
Interruptible	104	108	104	108
LDZ Large Loads	41	39	41	39
Total	**744**	**759**	**744**	**759**

Appendix 5 - One year ahead demand forecast errors by LDZ for 1998-2001[96]

LDZ	1998	1999	2000	2001	Absolute average
Scotland	-0.01%	1.70%	1.51%	-3.94%	1.8%
Northern	3.09%	-1.00%	6.57%	1.67%	3.1%
North West	0.52%	2.76%	0.58%	0.86%	1.2%
North East	-0.89%	-0.21%	2.19%	2.06%	1.3%
East Midlands	-0.14%	0.92%	0.39%	3.48%	1.2%
West Midlands	0.43%	1.70%	2.63%	1.21%	1.5%
Wales	5.11%	-5.17%	2.30%	6.77%	4.8%
Eastern	-1.82%	2.59%	1.32%	2.61%	2.1%
North London	-0.78%	0.27%	0.72%	0.46%	0.6%
South East	0.15%	1.08%	1.12%	0.50%	0.7%
Southern	-0.54%	1.75%	-0.69%	1.96%	1.2%
South West	0.40%	1.51%	5.37%	2.11%	2.3%

[96] Source: Deloitte calculations based on information received from Transco on 16 October 2002