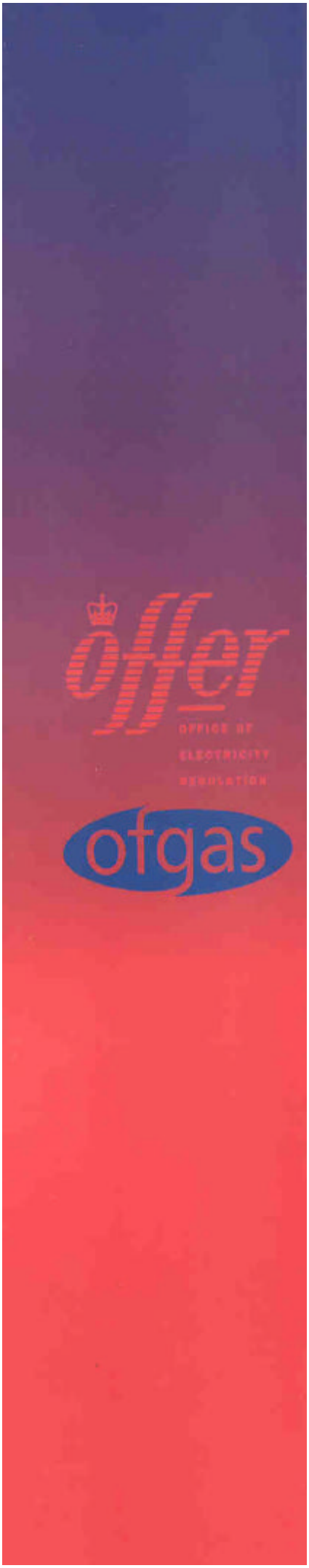

May 1999

Review of Public Electricity Suppliers 1998 - 2000

Distribution Price Control Review:

Consultation Paper

REVIEW OF PUBLIC ELECTRICITY SUPPLIERS
1998 - 2000

DISTRIBUTION PRICE CONTROL REVIEW

CONSULTATION PAPER

CONTENTS

FOREWORD

The original distribution price controls were put in place by the Government before privatisation. They were set to run for five years from 1 April 1990. New price controls for the 12 regional electricity companies (RECs) in England and Wales were proposed in August 1994 and revised in July 1995. New price controls for the two Scottish companies were proposed in September 1994. Following a Monopolies and Mergers Commission (MMC) inquiry the proposals for Hydro-Electric were modified in October 1995. All these distribution price controls are due for further revision from 1 April 2000.

OFFER published a consultation paper in February 1998 that explained that the present distribution price control review is part of a wider programme of reviews of public electricity suppliers (PESs) covering separation of businesses, competition in supply, metering, regulatory accounts, Scottish transmission price controls and Scottish trading arrangements.

In July 1998, OFFER published a consultation paper on price controls and competition in this programme of PES reviews. This described the main considerations likely to be relevant for the distribution price control review.

OFFER published a further consultation paper in December 1998 on PES business plans, which set out information derived from the PESs' responses to business plan questionnaires on distribution business operating costs, capital expenditure and quality of supply over the period until 2004/05.

This consultation paper sets out OFFER's initial thinking on the main considerations likely to be relevant for the distribution price control review. These include:

- form of the price control;
- operating costs;
- capital expenditure;
- quality of supply; and
- financial issues.

This document does not include OFFER's projections of distribution business operating costs and capital expenditure over the period of the revised price control, these will be set out in draft proposals for revised distribution price controls, to be published in the first half of August 1999 and in final proposals at the end of November 1999.

This timetable will synchronise the final proposals with those to be made by OFWAT for the water companies, so facilitating decisions on common issues, including those relating to multi-utilities.

If PESs do not accept the final proposals then it will be necessary to make reference to the Competition Commission (previously the MMC), which will consider these matters and report in due course. If a reference is necessary and it appears that the Competition Commission will not be in a position to make recommendations in time to allow licences to be modified from 1 April 2000, then it will be important to consider whether some sort of transitional arrangements or licence modifications might be appropriate to protect the interests of customers.

It would be helpful to hear from all those with an interest in these issues, including customers, their representatives and other int.erested groups, as well as the companies themselves. Views are invited by 2 July 1999 on matters raised in this paper. Responses should be sent to:

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Responses will be published by placing them in the OFFER library.

OFFER
May 1999

1 BACKGROUND

1.1 The distribution of electricity is an important business activity of the PESs and typically contributes the majority of their operating cash flow and profits. Distribution charges typically account for approximately 30 per cent of a domestic customer's bill and distribution has a significant influence on the overall quality of supply to customers.

1.2 The distribution price control review provides an opportunity to assess the present levels of distribution business costs and profits, strengthen incentives on PESs to operate efficiently and ensure customers benefit from the efficiency gains made while at the same time reinforcing incentives on PESs to maintain and improve quality of supply.

1.3 The distribution price control is one part of the broad regulatory framework within which PESs operate. For instance, there are PES licence conditions relating to financial ring-fencing which have been put in place following the take-over or merger of PESs. These limit the activities in which the PES may be involved and aim to protect it from adverse financial circumstances which might arise elsewhere in its group. Taken together with the statutory requirement on PESs to develop and maintain an efficient, co-ordinated and economical system of electricity supply, these measures provide an important safeguard for the interests of customers.

1.4 Section 3 of the Electricity Act 1989 (the "Act") puts the Director General of Electricity Supply (DGES) under a duty to exercise his functions in the manner which he considers is best calculated to meet the objectives set out in the section. The objectives first mentioned, which are sometimes referred to as the primary duties are:

- to ensure that all reasonable demands for electricity are satisfied;
- to secure that licence holders are able to finance their licensed activities; and
- to promote competition in generation and supply.

1.5 There follow other objectives, which are sometimes referred to as the secondary duties because the Act makes them subject to the ones listed above, and these include:

- the protection of the interests of customers in terms of prices and quality of services supplied;
- the promotion of efficiency and economy;
- the promotion of new techniques; and
- protecting the public from danger;

all taking into account the effect on the physical environment of the relevant activities.

1.6 The setting of a price control is a function to which the duties apply. In setting this price control, the DGES will be guided by these duties, and will ensure that a proper balance is maintained within the regulatory framework.

Objectives and Method for the Price Control Review

1.7 The primary objectives of this price control review are to strengthen the incentives on companies to increase efficiency and reduce costs, so that prices to customers can be lowered, while recognising that sufficient revenue must be raised to maintain an appropriate quality of service, to finance required new investment and to allow an appropriate return to shareholders.

1.8 These objectives are best achieved by aiming to encourage PESs to achieve an optimal balance between:

- quality of supply;
- efficient capital investment;
- efficient operating expenditure; and
- efficient financial management.

1.9 Deciding how best to define and measure each and judging the appropriate balance between them will be important elements of determining new price proposals for the PESs.

1.10 It will be important to encourage improvements in quality of supply and greater efficiency in managing costs and finances; and to penalise failures or degradations in quality of supply, or inefficiencies. It is for discussion whether penalties are currently strong enough, particularly in respect of those customers who experience markedly worse service than others. It is also for consideration whether, given the typically long-life of system assets, potential system degradation should also be penalised to prevent a PES gaining the benefit of savings which are judged likely to result in deterioration of its quality of supply in the longer term.

1.11 The importance of cost efficiency in the areas of capital expenditure, operating expenditure and financial management should not be understated. Each has a considerable impact on prices and on the profitability of a PES.

1.12 Table 1.1 shows the average costs of each in 1997/98.

TABLE 1.1: DISTRIBUTION BUSINESS COSTS AND REVENUES (1997/98 PRICES)

Cost Category	Costs in 1997/98 £billion	Percentage of 1997/98 electricity distribution revenues (4)	Percentage of typical domestic bill (excluding VAT)
Capital Expenditure (1)	0.8	21	5
Operating Expenditure (2)	1.65	43	10
Cost of Capital (3)	0.75	19	4½

Notes:

1 The regulatory depreciation has been used as proxy for annualised capital expenditure.
2 Excludes depreciation and NGC exit charges.
3 A figure of 7 per cent has been used, consistent with the assumption underlying the present price control.
4 Excludes NGC exit charges as these are outside price control revenue.

1.13 A 10 per cent difference in the annualised capital expenditure will change prices to a typical domestic customer by about ½ per cent. A similar difference in operating expenditure will have an effect of 1 per cent, while a change of 1 percentage point in the cost of capital (for example, from 7 per cent to 6 per cent) would suggest a two-thirds per cent movement to a typical domestic customer.

1.14 There are 12 PESs in England and Wales, which are sometimes called RECs, and two PESs in Scotland, although corporate activity in the sector means that the number of groups which contain PESs has fallen. The existence of a sufficient number of PESs allows comparisons to be made between them in respect of the four issues detailed in paragraph 1.8 above. These comparisons need to take into account potential differences between PESs due to demographic and other factors, but these are not sufficient to undermine the practicality of comparative analysis. Indeed, considerable importance is attached to having a reasonable number of companies to compare and reliance is placed on the comparisons made.

1.15 The performance of each PES is analysed in terms of:

- meeting its statutory duties and licence obligations;
- its own track record;
- the performance of other PESs;
- general market data; and
- the views of customers and other parties.

1.16 This comparative analysis should encourage efficiency and ensure that any differences between PESs in term at the level of distribution charges and quality of supply are properly justified.

1.17 Companies which perform satisfactorily by these criteria can expect to make an average rate of return. In the case of above average performance, companies can expect an above-average rate of return, however, this should only result from efficiency and not involve higher prices to customers.

1.18 Companies which under-perform can expect to make a lower rate of return. Customers should not be expected to pay for inadequate service; nor should they be expected to bear the costs of inefficiency or mismanagement by companies in their licensed activities. Therefore, the distribution price control review will focus on considering the efficient costs and quality of supply of the distribution businesses.

1.19 Nor should customers be affected by corporate factors outside the licensed activities. In particular they should not be expected to bear the costs of any requirements of other members of a PES's corporate group, if these arise outside the scope of the PES's licensed activities. By the same token, it could be argued that customers should not expect to benefit from factors arising outside the licensed activities, such as successful diversification.

1.20 These principles are consistent with the financial ring-fencing licence modifications agreed by most PESs, which require, among other things, PESs to safeguard their financial well-being.

1.21 The rest of this document sets out in detail the key issues relating to the distribution price control review. These include the approach to RPI-X regulation and incentives, establishing efficient levels of operating costs, capital expenditure, financing and quality of supply costs.

1.22 Chapter 2 looks at RPI-X regulation and the way in which it is applied in price control reviews; the use of comparative analysis in those reviews; the possible extension of this to a more transparent system of yardstick comparisons; the issues which such an extension might raise; more immediate issues relating to quality of supply; and error correction mechanisms. The chapter the goes on to consider issues relating to the scope, structure and duration of the control, energy efficiency and the environment. Finally, it explains the links between the distribution price control review and the proposals set out in the OFFER's 1999 paper on separation of businesses.

1.23 Chapter 3 describes issues relating to distribution business operating costs. It includes an assessment of distribution business cost movements over the period 1994/95 to 1997/98, and reviews PES forecasts over the period 1999/00 to 2004/05 as well as assessing their previous forecasting records. It then goes on to analyse costs in detail in 1997/98, making adjustments for differences in accounting policies and other factors. These adjustments lead to a base level of controllable costs for each distribution business. These are then assessed against the main factors driving distribution costs in each PES area, such as the number of customers, quantities of electricity distributed and the degree to which customers are scattered in rural areas or concentrated in urban areas. The analysis is extended to cover both operating and capital costs.

1.24 Issues relating to capital expenditure are considered in chapter 4. These include an initial assessment of whether the forecasts of distribution business capital expenditure made by the PESs in 1993 and 1995 were credible in the light of outturn results and whether and to what extent PESs have been able to reduce capital expenditure through improved efficiency.

1.25 One of the principal objectives of this price control review is to ensure that customers receive appropriate levels of quality of supply, with improvement as necessary, at minimum cost. Chapter 5 considers how quality of supply has developed in the present price control period; how much has been spent with a view to enhancing quality; and whether the benefits gained were commensurate with those costs. The results of this initial analysis will inform the choice among possible approaches to quality of supply in the forthcoming price control period. It will be important to establish a robust framework for quality of supply in the future including setting clear and appropriate targets, ensuring the availability of sound data about quality and setting appropriate penalties for companies who fail to meet quality standards.

1.26 Chapter 6 deals with financial issues. It starts with an assessment of the cost of capital and then deals with issues relating to asset valuation and the path of distribution charges in the short and long term. It then discusses the sort of supporting checks that it might be appropriate to carry out on the financial position of each distribution business and PES.

2 FORM OF THE CONTROL

Introduction

2.1 This chapter looks at RPI-X regulation and the way in which it is applied in price control reviews; the use of comparative analysis in those reviews; the possible extension of this to a more transparent and continuous system of yardstick regulation; the issues which such an extension might raise; more immediate issues relating to quality of supply; and error correction mechanisms. The chapter then goes on to consider issues relating to the scope, structure and duration of the control, energy efficiency and the environment. Finally, it explains the links between the distribution price control review and the proposals set out in OFFER's May 1999 paper on separation of businesses.

RPI-X Regulation

2.2 Each PES distribution business constitutes an effective regional monopoly. In order to protect customers from the potential abuse of monopoly power, each distribution business is subject to controls on the prices it can charge and the quality of service it must provide.

2.3 PES distribution businesses are subject to an RPI-X form of control, under which allowed revenue is related to a forecast of the number of customers supplied and to the volume of electricity distributed. This form of regulation has proven effective in providing clear targets for companies and has led to significant price reductions and quality improvements for customers to date.

2.4 The advantages and benefits of RPI-X regulation are demonstrated through the achievements of the PESs. Distribution operating costs have been reduced in real terms by about one quarter between 1994/95 and 1997/98. At the same time, customers have also benefited from a significant improvements in the quality of supply – for example, minutes lost per customer have reduced by about 10 per cent between 1994/95 and 1997/98.

2.5 However, RPI-X as practised also has some features which could be improved. In particular, ways need to be found to reduce the emphasis on periodic negotiation with the regulator; to increase the emphasis on outperforming peers; to address a potential imbalance between incentives to efficiency in respect of operating costs and capital costs; and to give clearer incentives in respect of quality of supply.

2.6 It is for consideration how best to maintain RPI-X as the primary mechanism while allowing these points to be addressed. It seems appropriate to seek to develop the RPI-X system so that:

- quality of supply is maintained at least cost;

- there are clearer incentives for companies to improve the quality of their outputs on a value-for-money basis;
- there is equal pressure on all costs, not just operating expenditure;
- there is less emphasis on periodic reviews, and a more explicit emphasis on continuing incentives for companies to improve on their own track record and outperform their peers;
- the application of coherent and transparent rules reduces the uncertainty for the managements of distribution businesses about the regulatory implications of their decisions
- PESs gain or lose according to their relative performance as well as their performance in relation to their own track records and objective standards; and
- regulatory uncertainty, and the additional cost of capital associated with it, is kept to a minimum.

Setting RPI-X Price Controls

2.7 Under RPI-X regulation, allowed revenues are set in advance for a period, usually about five years for natural monopoly businesses with long-lived assets such as electricity distribution. Prices are set by reference to projected costs during the period. This provides incentives for companies to reduce costs below the projected level, because by doing so they will retain the benefits of any efficiency gains at least until the next price control review. The benefits of lower costs are then passed on to customers at subsequent reviews.

2.8 Utility regulation in the UK has recently been reviewed by the Government. The outcome of that review supported the continued use of RPI-X regulation, provided regulators thought this was the most appropriate approach. It also encouraged regulators to consider greater use of error correction mechanisms alongside RPI-X regulation – for example, to deal with windfall events. Most respondents to OFFER's July 1998 consultation paper also supported the retention of RPI-X regulation.

2.9 OFFER agrees that RPI-X continues to be appropriate and proposes to continue using it as the primary price control mechanism. However, in doing so, it is important that certain features of the existing system of economic regulation are addressed.

2.10 There is an undue emphasis on the periodic review process. The importance for companies of the proposals and their ability to influence the outcome in favour of their shareholders may have led to a disproportionate amount of management time and effort being devoted to dealing with the regulator rather than to improving the business. This and other aspects of the application of RPI-X regulation have led to a form of regulatory game between the regulator and the regulated companies.

2.11 The periodicity of the price review process also creates distortions in incentives over the duration of a price control. These occur if the reward a

company receives for making an efficiency improvement is perceived to vary depending on the timing of the efficiency improvement. Companies may delay efficiency improvements that could be made towards the end of a price control period or distort the profile of capital expenditure programmes.

2.12 The information required to set a medium-term price control is substantial and the regulator must rely on companies for much of this information. The unavoidable information asymmetry between regulator and regulated companies is a major issue, since, especially under the current regime, regulated companies have an incentive to overstate required expenditures when discussing future price controls with the regulator.

2.13 There is a further asymmetry between the incentives to reduce capital expenditure and operating expenditure. Capital expenditure and operating expenditure have tended to be considered separately in setting price controls to date. At present, companies appear more certain of their incentive to improve operating efficiency than of their incentive to improve capital efficiency.

2.14 Furthermore, there appears to be insufficient continuous pressure in the existing arrangements. The focus appears to be on beating the projections on which the price control was based rather than on meeting objective standards at minimum cost and having a continuing incentive to outperform peers in the cost and quality of outputs.

2.15 It is therefore important as part of the present review to investigate further developments which might be made to the existing system of regulation to overcome these shortcomings, without losing the benefits of RPI-X regulation referred to earlier.

The Role of Inter-Company Comparisons at Price Reviews

2.16 To compensate for many of the issues raised above, inter-company comparisons can be used in periodic price reviews. Some important company-specific factors notwithstanding, few industries comprise businesses so similar in nature to each other as the electricity distribution businesses of the PESs. Inter-company comparisons have been used in the past by OFFER to inform the setting of prices at periodic reviews, and continue to be so.

2.17 For instance, during the present review, OFFER will:

- make comparisons of the relative cost efficiency of companies;
- make comparisons of the relative quality of supply performance of companies; and
- use these comparisons to challenge companies' projections of future operating and capital costs and the costs of meeting quality of supply performance levels.

2.18 Using comparative analysis at periodic price reviews requires the resolution of a number of issues. For example, in implementing comparative efficiency assessments, there is a need to identify an explanatory model of distribution costs.

2.19 For instance, adjustments are needed to allow for significant variations in operating environment, such as the number of customers, the density/sparsity of customers and the levels of demand. Factors such as these may cause costs to vary even between equally efficient companies, although probably not by as much as some PESs claim.

2.20 A method also needs to be devised to take account of similar factors affecting variations in the quality of supply across companies.

2.21 The judgements about these issues need to be made in any regulatory pricing system. But the link between such comparative analysis and the setting of the price control could be more explicit, with benefits for PESs in managing their businesses and additional regulatory clarity.

2.22 As described above, the use of inter-company comparisons at periodic price reviews cannot resolve all of the shortcomings associated with RPI-X regulation. It is therefore worth investigating the possibility of making greater use of yardstick comparisons on an ongoing basis.

Yardstick Regulation

2.23 Yardstick regulation focuses on the group of companies to be regulated. The prices a company is allowed to charge are set by reference to the cost and quality performance of its peers. Like all methods of comparing companies, it requires that the data used is well-chosen, consistently defined and measured.

2.24 This is not the case at present, where the divergence between the companies' track records of reducing costs raises issues relating to the quality of information. There is a clear need to improve the specification and understanding of the data required for regulatory purposes and to undertake more regular auditing and analysis of this data. This should lead to an improvement in the quality of data supplied to OFFER and a better and more consistent understanding of how the distribution businesses are performing.

2.25 Additional incentive mechanisms based on yardstick comparisons could encompass both comparative cost efficiency and comparative quality of supply performance, or these could be subject to separate incentive mechanisms.

2.26 These improvements would not eliminate all the practical difficulties encountered in more straightforward RPI-X systems. But they appear to be a logical development of the existing process of price controls and their pursuit appears to be in the interest of customers.

Error Correction Mechanisms

2.27 The Government's recent review of utility regulation recommended that consideration should be given to the use of error correction mechanisms (ECMs) to overcome some of the perceived shortcomings in RPI-X regulation particularly in the case of windfall gains and misleading forecasting by companies.

2.28 One potential application of ECMs is in relation to capital expenditure**.** Chapter 4 presents an analysis of actual capital expenditure in relation to allowed capital expenditure in the present review period. Evaluating the nature and implications of capital expenditure underspend or overspend on any one year is not straightforward. Therefore, while it will be important to enhance the arrangements for monitoring capital expenditure, it is likely that any adjustments for past underspend or overspend would best be made at the price control review.

Timing and Implementation Issues

2.29 Arrangements will be made in the present review for a programme of work and consultation in order to review the development of RPI-X as currently practised. If this programme identifies worthwhile amendments, it is proposed to prepare the ground for improved incentive mechanisms to be introduced as soon as practicable. Given the complexity and importance of this task, it is unlikely to be complete in time to introduce additional measures at the start of the next review period. However, once the necessary analysis has been undertaken, it may be desirable to introduce the additional measures during the next review period. It will therefore be necessary to consider the feasibility of introducing additional mechanisms between price reviews. It will be important to understand at the time the new price controls are set how this process will be managed. It may be appropriate as part of that process to consider limiting the financial impact of the additional measures for a transitional period.

2.30 In order to prepare the ground for the improvements in the form of regulation discussed here, a programme of work and consultation is proposed encompassing the following:

- identification and definition of the appropriate yardsticks (including cost and quality measures);
- specification of how the relevant data should be gathered and audited;
- determination of the appropriate rewards and penalties; and
- design of the settlement process by which the financial consequences are given effect.

Scope

2.31 The present distribution price control covers all charges made by the PESs' distribution businesses except those for certain excluded services and the pass through of certain NGC transmission charges. There are presently eight categories of excluded revenue, as set out below:

- extra high voltage (EHV) charges;
- top-up and standby charges;
- non-trading rechargeables;
- prepayment meter distribution business surcharges;
- special metering charges;
- special meter reading charges;
- other minor activities and charges; and
- connection charges.

2.32 In 1997/98 aggregate price control revenue was about £3500 million, excluded service revenue £300 million, capital receipts from connection charges about £250 million and revenue associated with the recovery of NGC exit charges about £200 million.

2.33 The categories of excluded services generating the most revenue are non-trading rechargeables, prepayment meters and EHV charges. Non-trading rechargeables are generally related to specific requests made by third parties for a PES to carry out work on its distribution system (for example, moving lines and cables to accommodate the needs of public authorities or developers). The volume of such work tends to vary unpredictably from year to year. In these circumstances it seems sensible to continue with existing arrangements that exclude these charges from the distribution price control. Issues relating to prepayment meter distribution business surcharges are described in paragraph 2.52 and will be dealt with in more detail in a consultation paper on these matters to be published later this summer. Large users have expressed some concerns that EHV charges have not reduced at the same rate as price controlled charges. EHV charges are presently being investigated by OFFER with the intention of establishing whether any revised arrangements for the regulation of these charges might be appropriate.

2.34 Connection charges are levied when a customer first connects to the distribution system or makes a material change in supply requirements, for example by requesting a higher capacity connection. Connection charges

are treated as capital receipts by the PESs' distribution business and are outside the scope of the price control. Since privatisation aggregate connection charge receipts have remained broadly level averaging about £250 million per year in 1997/98 prices, representing about 20 per cent of total distribution business capital expenditure. In December 1998, OFFER published a consultation paper on competition in connections. In the light of these trends and developments it appears appropriate to continue to exclude these charges from price control.

2.35 The 12 RECs pay transmission connection point exit charges to NGC. The RECs recover these costs through distribution use of system charges and at present they are treated as cost pass-through for the purposes of the distribution price control. This may reduce incentives on distribution businesses to manage costs in an efficient way. However, the review of electricity trading arrangements may have implications for the structure of NGC's charges and until these are resolved it would be inappropriate to include any transmission charges within the scope of the distribution price control.

Structure

2.36 The present definition of the distribution business includes a range of activities associated with metering and meter reading. The costs of providing these services were taken into account in setting the present price control. It was recognised, however, that with the onset of competition in supply changes might need to be made in this area. Accordingly, the distribution price control was set to include two components, one associated with meter related activities and the other related to other distribution activities. Subsequently, the introduction of competition in supply required distribution businesses to provide new services for suppliers, including data aggregation and meter point administration. To reflect the costs of providing these new services a modification was made to the distribution price control.

2.37 The May 1999 paper on separation of businesses includes proposals on the treatment of metering activities on the future. These clarify distribution business responsibilities with respect to metering and so it will not be necessary for the revised control to have a separate metering component. However, the distribution business will continue to be required to provide certain metering activities and meter point administration services, and so these costs will need to form part of the assessment of overall distribution business costs. The implications of the separation of business paper for the distribution price control review are described in more detail in paragraphs 2.48 to 2.51**.**

2.38 Price controls can be designed so that the permitted level of total revenues varies with changes in volumes as well as being indexed to the RPI. Under the original distribution price control, allowed revenue increased in proportion to units distributed. The last distribution price control review

concluded that the weight of units distributed in the revenue driver of the price control should be halved, from 100 per cent to 50 per cent. The remaining 50 per cent was fixed by relating it to a predetermined projection of customer numbers. This change was intended to avoid any artificial incentive on the PESs to promote increased sales of electricity. The retention of a weighting for units distributed, albeit at a reduced level. was intended to maintain the normal commercial incentives on companies to seek out and meet the needs of their customers. It would also avoid undue fluctuations in distribution charges per unit as the volume of output varied.

2.39 In its May 1997 report on BG the MMC recommended a price control revenue driver with a 50 per cent fixed and 50 per cent unit element, broadly consistent with the existing revenue driver in the distribution price control. The majority of respondents to the July 1998 consultation paper who mentioned this issue supported the continuation of the existing weighting in the revenue driver for the distribution price control. Taking all these factors into account suggests continuing with a revenue driver based on 50 per cent units and 50 per cent customer numbers.

Duration

2.40 Regulators have tended to set monopoly price controls for between 4 and 6 years. Respondents to the July 1998 consultation paper generally supported a 5 year control.

2.41 The longer the time for which a price control is set, the greater the incentive companies have to make efficiency savings. However, a longer duration also increases the risk of unexpected circumstances, and the possibility of company performance being significantly different from the projections and assumptions used in setting the price control.

2.42 This chapter sets out some of the difficulties associated with RPI-X regulation and some of the measures that might be developed to try to deal with these difficulties including more rigorous requirements on the auditing of data and the increased use of comparative analysis.

2.43 Some of the revised arrangements may take a number of years to put in place. Therefore, there is some uncertainty about the robustness of the present analysis relating to costs and quality of supply. This should be resolved by the time final proposals are published at the end of November 1999. Assuming this is the case then proposals for the revised price control will be for a five year duration, otherwise a shorter duration control may be appropriate.

2.44 In either case, there will be additional changes to the regulatory regime over the next five years, to put in place the additional requirements on PESs, relating to the auditing of data, and the possible further development of yardstick regulation.

Energy Efficiency

2.45 In reaching decisions during the distribution price control review it will be necessary to take account of the DGES' statutory duties, which include promoting the efficient use of electricity and also taking into account the effect of the physical environment of activities connected with the supply of electricity. In the last distribution price control review the revenue driver of the price control was modified so as to remove any artificial incentive on the PESs to increase sales of electricity; and incentives on the PESs to reduce the electrical losses on their networks were strengthened.

2.46 Table 2.1 shows the average distribution losses on each distribution network since privatisation. Although losses have fallen since 1990/91, over the period of the present price control they have remained broadly level.

2.47 In the light of this OFFER's technical consultants have been asked to review and report on the likely effect of each company's capital expenditure programme on the level of electrical losses. This work programme should help establish whether each distribution business is taking reasonable steps to minimise distribution losses.

TABLE 2.1: DISTRIBUTION LOSSES FOR LV AND HV CUSTOMERS

PES s	1990/91 %	1991/92 %	1992/93 %	1993/94 %	1994/95 %	1995/96 %	1996/97 %	1997/98 %
Eastern	7.0	7.0	6.8	6.5	6.7	6.9	7.1	7.0
East Midlands	6.6	6.5	6.7	6.8	6.0	6.1	6.1	6.1
London	7.8	7.2	7.0	7.0	7.1	6.7	7.1	6.8
Manweb	9.8	8.1	8.7	8.7	8.1	8.8	8.8	9.0
Midlands	6.2	5.9	5.7	5.5	5.5	5.5	5.6	5.5
Northern	7.5	7.6	6.8	7.2	6.1	6.8	6.9	6.7
NORWEB	7.1	7.1	6.3	6.3	6.4	4.8	5.0	5.7
SEEBOARD	7.9	7.7	7.6	7.5	7.5	7.1	7.6	7.7
Southern	7.1	7.2	7.1	7.0	7.0	7.2	7.2	7.2
SWALEC	8.9	8.4	8.1	7.0	7.0	6.7	8.0	6.9
South Western	8.6	8.5	8.5	8.3	7.3	7.2	7.9	7.3
Yorkshire	6.3	6.3	6.2	6.2	6.5	6.5	6.5	6.5
ScottishPower	8.5	7.2	7.7	8.1	8.0	6.7	7.2	7.2
Hydro-Electric	9.5	8.9	9.0	9.1	9.1	9.0	9.0	9.1
Average	7.6	7.2	7.1	7.0	6.9	6.7	6.9	6.8

Note: The averages are weighted by the number of units distributed.

2.48 OFFER's July 1998 consultation paper noted that as part of the review of supply price controls consideration would be given as to whether the energy efficiency Standards of Performance should continue and if so on what basis. These matters will be dealt with in a consultation paper on energy efficiency issues to be published later this summer.

Metering and Separation

2.49 In order to promote competition in supply and metering OFFER's May 1999 separation of businesses paper makes a number of proposals for revised arrangements in relation to metering and the separation of the PESs' distribution and supply businesses. These include:

- the transfer of meter reading, data aggregation and data processing activities from distribution to supply from 2000/01 onwards;
- enhancing the separation of distribution and supply businesses, including restrictions on the extent of joint services between the businesses;

- the need to consider any transitional costs arising as a result of introducing the new arrangements in the context of promoting competition in supply and metering, the potential improvements in management control and efficiency and the scope for increase in shareholder value which might be realised by merger and acquisition activity; and
- new obligations on the distribution business with respect to the provision of metering reading services of last resort from 2000/01.

2.50 These proposals for revised arrangements appear to have the following five main implications for the for the distribution price control review:

- the assessment of distribution business operating costs needs to take account of the transfer of metering activities from distribution to supply in 2000/01. As a first step in developing projections of distribution businesses operating costs excluding these activities Chapter 3 sets out an analysis of costs in 1997/98 which separately identifies the costs of meter reading. This will be used as a basis for making projections of costs over the period of the revised distribution price control;
- consistent with the proposals in the separation of businesses paper to minimise the opportunities for cross-subsidy between the distribution and supply businesses, Chapter 3 contains a preliminary assessment of advertising, customer service, billing and corporate costs. This will be further developed as the distribution price control review progresses to ensure that the projections underlying the revised distribution price controls include reasonable assumptions about the allocation and attribution of these costs;
- the impact, if any, of the revised arrangements for separation on the day-to-day costs of running the distribution businesses will need to be assessed;
- Midlands has already agreed to sell its supply business to National Power. As part of these arrangements Midlands has agreed to an enhanced degree of separation between its distribution and former supply business. This appears to confirm that there is scope for the increased separation of distribution and supply without the need for the recovery of any transitional costs from distribution business customers; and
- the revised distribution price controls will need to take account of the new obligation on distribution businesses to provide a meter reading service of last resort. Given that the costs and revenues associated with this sort of obligation are likely to be difficult to predict it may be appropriate to treat the revenue as an excluded service. In these circumstances the revenue would fall outside the main price control. It is for consideration whether this would provide sufficient protection for the interests of competing suppliers and customers or whether additional measures might also be appropriate. In particular competition in meter reading is likely to take some time before it is fully established and so safeguards would be required for at least a period of time. These could involve placing a licence obligation on each distribution business

requiring it to adopt procedures designed to ensure that its meter reading services are provided at the lowest reasonable cost and/or establishing a cap on the charges for this service, perhaps on the basis of a maximum charge per customer or reading.

2.51 It will also be important to consider whether the present form of the distribution price control is consistent with the development of competition in meter ownership and meter operation, which will continue to be distribution business activities. If competition develops further in these activities and a distribution business loses market share this should not lead to an increase in its profits. Therefore, it will be necessary to consider the introduction of arrangements that, in these circumstances, would reduce distribution business revenue by an estimate of the savings in avoidable costs associated with reduced activity in these areas.

2.52 As explained in OFFER's July 1998 consultation paper, special considerations apply to the arrangements for prepayment meter customers. The main implications for the distribution price control review of these arrangements relate to the excluded service revenue that is presently derived from distribution business prepayment meter surcharges. At present these charges vary between zero and about £30. This range appears to be unjustifiable in relation to the associated costs and more uniform arrangements are likely to be appropriate in the future. These matters will be dealt with in detail in a consultation paper on prepayment meters to be published later this summer.

Issues for Consideration

2.53 Views are invited on any aspect of the issues raised in this chapter and in particular on:

- the objectives for developing RPI-X regulation identified in paragraph 2.6;
- whether the approach to comparative analysis identified for this price control review is appropriate;
- the proposals for further developing yardstick regulation;
- the proposals for the structure of the revised control; and
- whether the approach to energy efficiency issues is appropriate.

3 OPERATING COSTS

Introduction

3.1 Distribution business spending can be broken down into capital costs and operating costs. Capital costs cover spending on assets the benefit of which would be expected to last over several years, such as transformers or switchgear. Operating costs cover the day to day costs of running the network, such as repairs and maintenance, planning, control, overhead costs, NGC exit charges and distribution system business rates.

3.2 In the calculations underlying the present price control PESs were given an allowance for operating costs. Typically this allowance made up about half of allowed revenue. Therefore, the assessment of operating costs is likely to have a significant impact on the overall level of price control revenue.

3.3 When setting a price control it is important to give PESs properly balanced incentives between capital and operating spending. If incentives are unbalanced, PESs may either reclassify one type of expenditure as another, or faced with alternative capital and operating spending choices, make decisions which have a higher overall cost to customers in the long run.

3.4 OFFER has appointed Pannell Kerr Forster (PKF) as consultants to assist with the analysis of operating costs. PKF is examining distribution business operating costs in 1997/98 and PES forecasts of operating costs over the period to 2004/05. As the price review progresses further details of PKF's analysis will be published.

3.5 Around one third of operating costs is considered to be largely outside the control of the companies, including NGC exit charges and distribution system business rates. The 12 RECs pay transmission connection point exit charges to NGC, which are subject to separate regulation and are outside the scope of the existing price control (in Scotland transmission charges are paid by generators and suppliers, in contrast to arrangements in England and Wales which also encompass distribution). Distribution system business rates are levied by the government on all the PESs, and, in the short term, distribution business management can do little to influence these costs.

3.6 PESs have more direct control over the remaining two thirds of operating costs. These include:

- engineering costs - the costs of planning, monitoring and controlling the system, and repairing and maintaining distribution business assets;
- customer service costs - at present PESs tend to allocate customer service costs between distribution and supply, so the distribution business incurs a proportion of the cost of running call centres, maintaining customer records and billing; and

- corporate costs - certain costs cannot be directly attributed to any particular business but are incurred in running the PES as a whole. At present companies tend to allocate a significant proportion of corporate costs to the distribution business.

3.7 Capital expenditure on information technology systems, vehicles and certain property is classified as non-operational capital expenditure. However, some PESs do not provide these services from within the distribution business, instead using third party contractors or affiliated service companies. For these PESs the costs of providing these services may appear as a distribution business operating cost rather than as distribution business capital expenditure. To adjust for this in the last distribution price control review an amount was added to the operating costs of these PESs, and subtracted from their capital expenditures, to represent the level of non-operational capital expenditure and to standardise accounting treatments across PESs. It will be appropriate to consider non-operational capital expenditure together with operating costs as part of this review and ensure that any allowance for non-operational spending represents an efficient level of expenditure.

3.8 This chapter includes an assessment of distribution business cost movements over the period 1994/95 to 1997/98, and reviews PES forecasts over the period 1999/00 to 2004/05 as well as assessing their previous forecasting records. It then goes on to analyse costs in detail in 1997/98, making adjustments for differences in accounting policies, cost allocations and attributions. In addition to these accounting adjustments, other adjustments are discussed, for factors such as differences in regional labour costs and the different arrangements applying in Scotland for the ownership and operation of 132 kV system assets. These further adjustments lead to a base level of controllable costs for each distribution business. These are then assessed against the main factors driving distribution costs in each PES area, such as the number of customers, quantities of electricity distributed and the degree to which customers are scattered in rural areas or concentrated in urban areas. The analysis is extended to cover both operating and capital costs, although it is important to consider the PESs' relative performance with respect to quality of supply when interpreting the results. Finally, there is a description of PKF's further work on PES distribution business costs.

Movements in Costs Since 1994/95 and the PESs' Forecasts for the Period Until 2004/05

3.9 Table 3.1 shows total operating costs for PES distribution businesses, less depreciation of network assets, NGC exit charges and distribution system business rates. The depreciation of non-operational assets provides an annualised proxy for non-operational capital expenditure.

3.10 In aggregate, PES distribution business operating costs (excluding depreciation of network assets, NGC exit charges and distribution system

business rates) fell by more than one quarter between 1994/95 and 1997/98. There are wide variations between companies, with SEEBOARD, Southern and South Western showing the greatest falls, between them removing nearly one half of their costs. Other PESs reported smaller reductions in costs, while Hydro-Electric's costs remained broadly level between 1994/95 and 1997/98.

3.11 In contrast to the significant reductions in costs over the period 1994/95 to 1997/98, in aggregate the PESs are forecasting costs on a comparable basis to rise at the start of the next price control period in 2000/01 before falling back to present levels by about 2004/05. There is variation between individual PESs, with seven companies forecasting real falls in costs between 1997/98 and 2004/05, three forecasting these costs to remain at about the same level in real terms and four forecasting real increases in costs.

TABLE 3.1A: PES DISTRIBUTION BUSINESS OPERATING COSTS EXCLUDING DEPRECIATION OF NETWORK ASSETS, NGC EXIT CHARGES AND RATES (1997/98 PRICES £MILLION)

PES	Actual		PES forecasts	
	94/95	97/98	00/01	04/05
Eastern	195	151	162	160
East Midlands	158	146	148	134
London	194	128	136	123
Manweb	107	84	92	85
Midlands	152	128	126	113
Northern	129	99	100	90
NORWEB	182	129	139	131
SEEBOARD	146	81	101	88
Southern	149	88	97	84
SWALEC	110	75	81	71
South	157	74	96	84
Western	135	101	115	106
Yorkshire	109	100	109	100
ScottishPowe r	57	60	63	51
Hydro-Electric	1980	1444	1564	1420
Total				

TABLE 3.1B: PES DISTRIBUTION BUSINESS OPERATING COSTS EXCLUDING DEPRECIATION OF SYSTEM ASSETS, NGC EXIT CHARGES AND RATES (PERCENTAGES)

PES	Actual		PES Forecasts	
	94/95 %	97/98 %	00/01 %	04/05 %
Eastern	129	100	107	106
East Midlands	108	100	102	92
London	152	100	107	96
Manweb	128	100	110	102
Midlands	119	100	98	89
Northern	130	100	101	91
NORWEB	141	100	108	101
SEEBOARD	180	100	124	108
Southern	169	100	109	95
SWALEC	146	100	107	94
South	212	100	129	113
Western	134	100	114	105
Yorkshire	108	100	109	99
ScottishPowe r	95	100	105	85
Hydro-Electric	137	100	108	98
Total				

3.12 The reduction in aggregate PES distribution business operating costs shown in the above table of over one quarter between 1994/95 and 1997/98 suggests that the PESs' forecasts may be overestimating the future level of costs. An important further element in judging whether PES forecasts are likely to be reasonable is the PESs' previous forecasting record.

The PESs' Forecasting Records

3.13 Table 3.2 shows forecasts made by the PESs in 1994 and 1995 as part of the last price control review. In aggregate PESs forecast that operating costs (excluding all depreciation and NGC exit charges) would fall by about

7 per cent between 1994/95 and 1997/98. As it turned out costs fell much further. In aggregate costs actually fell by about one quarter between 1994/95 and 1997/98. There is significant variation between companies. For example, Eastern forecast a 9 per cent real increase in costs while actual costs fell 23 per cent. London forecast a 21 per cent reduction in costs but achieved a real reduction of 36 per cent. Hydro-Electric forecast that costs would remain broadly level, consistent with its outturn costs. There are also significant variations in the patterns of companies' cost movements. However, most PESs reduced costs significantly more than forecast. Those with closer correlation between forecasts and outturns tend to have reduced costs least.

TABLE 3.2: PES DISTRIBUTION BUSINESS OPERATING COSTS EXCLUDING DEPRECIATION AND NGC EXIT CHARGES (1997/98 PRICES)

	1994/95	1995/96	1996/97	1997/98
Eastern				
Actual (£M)	199	197	175	153
Forecast (£M)	237	244	246	258
Difference (%)	19%	24%	41%	69%
East Midlands				
Actual (£M)	162	161	150	152
Forecast (£M)	170	173	172	176
Difference (%)	5%	8%	15%	16%
London				
Actual (£M)	205	171	156	132
Forecast (£M)	203	170	164	160
Difference (%)	(1%)	(1%)	5%	21%
Manweb				
Actual (£M)	118	115	94	95
Forecast (£M)	154	122	116	114
Difference (%)	31%	6%	24%	20%
Midlands				
Actual (£M)	159	138	136	138
Forecast (£M)	169	159	157	157
Difference (%)	6%	15%	16%	14%
Northern				
Actual (£M)	141	132	117	112
Forecast (£M)	140	135	129	125
Difference (%)	(1%)	2%	10%	11%
NORWEB				
Actual (£M)	187	251	152	139
Forecast (£M)	191	174	169	166
Difference (%)	2%	(31%)	12%	19%
SEEBOARD				
Actual (£M)	151	140	78	91
Forecast (£M)	153	132	133	134
Difference (%)	1%	(5%)	70%	48%
Southern				
Actual (£M)	172	121	122	111
Forecast (£M)	190	188	190	190
Difference (%)	11%	56%	55%	72%
SWALEC				
Actual (£M)	115	91	75	83
Forecast (£M)	116	104	102	100
Difference (%)	1%	14%	37%	21%
South Western				
Actual (£M)	169	148	93	87
Forecast (£M)	146	133	132	132
Difference (%)	(14%)	(10%)	43%	52%
Yorkshire				
Actual (£M)	150	124	131	113
Forecast (£M)	155	148	150	151
Difference (%)	3%	20%	14%	33%
ScottishPower				
Actual (£M)	125	123	128	116
Forecast (£M)	112	111	112	112
Difference (%)	(10%)	(10%)	(12%)	(3%)
Hydro-Electric				
Actual (£M)	66	67	66	67
Forecast (£M)	62	63	64	63
Difference (%)	(6%)	(6%)	(3%)	(6%)

Further Analysis

3.14 The variation between PESs in previous cost reduction, the contrasting pattern of forecasts compared to historic trends and the inaccurate forecasting record of the PESs in the past all suggest a detailed assessment of operating costs is required. This is also necessary so that costs can be adjusted in a way that is consistent with the proposals in the paper on the separation of businesses.

3.15 As part of this analysis it will be important to standardise reported operating costs for differences in accounting policies and revised arrangements for separation. It will be particularly important to consider:

- the capitalisation of expenditure;
- cost allocations and recharges between the supply, distribution and other activities of the PESs; and
- restructuring costs, provisions and exceptional items.

Capitalisation Policy

3.16 In preparing its distribution business regulatory accounts each PES has exercised a degree of flexibility with respect to the classification of expenditure as between operating costs, non-operational capital expenditure and network capital expenditure.

3.17 A number of PESs have made changes to their capitalisation policies since the last distribution review. One example is in respect of the repair of underground cables. Another is in respect of meter recertification costs. These changes have the effect of reducing the amount of operating costs, and increasing the amount of capital expenditure. There may also have been a degree of difference in capitalisation policy between PESs before the present changes were made.

3.18 OFFER has asked its consultants to quantify differences caused by different capitalisation policies. A preliminary assessment made by the consultants for the year 1997/98 identified six companies as having capitalisation policies which differed from the norm and caused transfers from operating costs to network capital expenditure of over £1 million per year, with three of these companies having made changes to capitalisation policies which have significantly distorted the trends in operating costs and capital expenditure over the period 1994/95 to 1997/98. Table 3.3 sets out preliminary estimates of the transfers to operating costs necessary to normalise costs for differences in capitalisation policy in 1997/98.

TABLE 3.3: INITIAL ESTIMATES OF THE TRANSFERS TO OPERATING COSTS FROM CAPITAL EXPENDITURE TO NORMALISE FOR DIFFERENCES IN ACCOUNTING POLICY (1997/98 PRICES £MILLION)

PES	Repairs	Metering	IT Depreciation	Other	Total
Eastern	-	-	-	-	-
East Midlands	-	-	-	-	-
London	-	-	-	-	-
Manweb	0.4	-	1.3	-	1.7
Midlands	-	-	-	-	-
Northern	-	-	-	-	-
NORWEB	3.6	-	-	-	3.6
SEEBOARD	8.5	0.5	1.3	1.0	11.3
Southern	5.3	4.1	-	-	9.4
SWALEC	-	-	-	-	-
South Western	-	-	0.4	-	0.4
Yorkshire	11.9	3.5	-	-	15.4
ScottishPower	0.7	-	2	-	2.7
Hydro-Electric	-	-	-	-	-
Total	30.4	8.1	5.0	1.0	44.5

Allocations, Attributions and Recharges

3.19 Table 3.4 shows the proportions of allocations and recharges within distribution business costs in 1997/98. The definition of costs in this table includes historic cost depreciation. The figures were completed by each PES as part of its response to business plan questionnaires. Categories shown are costs directly incurred by the distribution business, costs subject to allocation, and costs charged from other businesses of the PES and other group companies.

TABLE 3.4: PROPORTION OF DISTRIBUTION COSTS DIRECTLY INCURRED, ALLOCATED AND RECHARGED

PES	Direct %	Allocated %	Recharges %	Total %
Eastern	68	32	0	100
East Midlands	78	15	7	100
London	61	32	7	100
Manweb	78	15	7	100
Midlands	71	26	3	100
Northern	41	6	53	100
NORWEB	63	4	33	100
SEEBOARD	71	20	9	100
Southern	84	5	11	100
SWALEC	67	10	23	100
South Western	72	14	14	100
Yorkshire	74	15	11	100
ScottishPower	74	19	7	100
Hydro-Electric	83	17	0	100

3.20 There are significant differences between PESs in their corporate structures and cost allocation procedures and consequently in the proportions of costs allocated and rechargable between supply and distribution businesses.

3.21 An accounting guideline known as CSC 194, introduced before privatisation, sets out guidance on the placing of costs between supply and distribution. For example, under the guideline the cost of maintaining customer records is divided equally between distribution and supply. The development of proposals for the greater separation of distribution and supply activities and the concurrent reviews of the distribution and supply price controls provide an opportunity for costs to be attributed according to the activity driving the costs, as opposed to the existing arrangements which allow costs to be recharged or allocated on a relatively arbitrary basis.

3.22 OFFER has asked PKF to investigate the present cost allocation and replace them, wherever possible, with attributions made on a usage basis consistent with the proposals for separation. To this end PKF have made preliminary adjustments in the following cost areas:

- advertising and marketing: costs have been allocated entirely to supply, except where PESs can demonstrate that costs relate properly to distribution activities, for example the publication of use of system tariff leaflets;
- customer services: costs have been allocated between supply and distribution based on the number of contacts received by PESs from customers in relation to each activity. In the light of the proposal to move meter reading activities to the supply businesses, contacts made regarding meter readings have been treated as supply contacts;
- billing: the costs of billing supply business customers have been allocated into supply. The only billing costs attributable to distribution are those in respect of billing suppliers for DUOS charges, and one off work carried out by the distribution business;
- metering: the costs of meter reading and of data aggregation and processing have been attributed to supply in line with the proposals in the separation of businesses paper;
- corporate: by their nature, it is difficult to attribute corporate overheads on a usage basis. To overcome this difficulty, CSC 194 took, as a measure of activity, salaries and net assets, measured on a current cost basis. By following CSC 194, RECs on average allocate around 90 per cent of such costs into distribution. Developments in supply businesses since 1990 question whether the allocation of such a high level of costs into distribution is a reasonable reflection of the usage of corporate assets and staff. Therefore PKF has reallocated corporate overheads on the basis of the following four measures within each PES:

    - turnover;
    - historic cost operating profit;
    - employee numbers; and
    - historic cost net assets;

  giving equal weight to each.

3.23 For the RECs, this method would lead to around two thirds of corporate costs remaining in distribution, and one third being allocated to supply. For the Scottish PESs about one third of corporate costs would remain in distribution, reflecting their extensive generation and transmission activities. These allocations will need to be considered further as the price control review progresses.

3.24 Table 3.5 sets out the consultants' initial estimates of the changes to distribution operating costs arising out of these revised allocations and attributions of costs. PESs have already commented on these adjustments and have suggested that in certain respects the adjustments over-estimate

the reductions necessary to derive an appropriate base level for distribution business costs. These comments will be assessed in detail as the price control review progresses. Nevertheless, it will be important to ensure that distribution does not cross-subsidise other activities, and it appears that the present reported level of distribution costs significantly over-estimates the base level of costs that will be appropriate in the future, given the revised arrangements described in the separation of businesses paper.

TABLE 3.5: INITIAL ESTIMATES OF THE ADJUSTMENTS TO DISTRIBUTION OPERATING COSTS ARISING FROM REVISED ARRANGEMENTS FOR THE ALLOCATION AND ATTRIBUTION OF COSTS (1997/98 PRICES £MILLION)

PES	Advertising & Marketing	Customer Services	Billing	Metering	Corporate	Other	Total
Eastern	(1.8)	(19.4)	-	(8.6)	(4.4)	-	(34.2)
East Midlands	(4.2)	(1.5)	(3.9)	(10.8)	(2.4)	-	(22.8)
London	(1.5)	(18.1)	(5.5)	(9.2)	(2.1)	(1.3)	(37.7)
Manweb	(5.6)	(6.1)	-	(6.4)	(3.5)	-	(21.6)
Midlands	(0.1)	(1.8)	(0.5)	(14.8)	(2.7)	-	(19.9)
Northern	(0.9)	(6.5)	(0.2)	(5.8)	(1.9)	(0.4)	(15.7)
NORWEB	(1.3)	(8.3)	(2.5)	(8.3)	(3.8)	(0.3)	(24.5)
SEEBOARD	(5.0)	(14.6)	-	(6.9)	(1.4)	-	(27.9)
Southern	(1.2)	(3.1)	-	(3.0)	-	-	(7.3)
SWALEC	(1.7)	(1.9)	-	(2.9)	(1.5)	(0.1)	(8.1)
SouthWestern	(0.3)	(3.6)	(0.4)	(4.2)	(1.9)	(0.1)	(10.5)
Yorkshire	-	(9.9)	(0.2)	(8.1)	(2.1)	(0.1)	(20.4)
ScottishPower	(6.3)	(3.1)	(2.4)	(8.2)	(2.8)	(1.5)	(24.3)
Hydro-Electric	(0.4)	(1.7)	(0.2)	(0.4)	(3.1)	-	(5.8)
Total	(30.3)	(99.6)	(15.8)	(97.6)	(33.6)	(3.8)	(280.7)

3.25 Certain PESs have structured themselves in such a way that services used by the distribution business are provided outside the distribution business but within the wider group of companies of which distribution is a part. Examples of this include the provision of transport fleets and non-operational property. Typically, the charge for the provision of the service includes an element of profit. Many of the businesses making recharges have little or no trade outside the group. An effect of this appears to be an increase in distribution business costs and the transfer of profits from the regulated business to elsewhere in the group. OFFER's consultants are removing the margins from recharges from other companies in the group, except where those companies presently carry out a significant element of their trade externally to the group, presently assumed to be 50 per cent or

more. A similar approach is presently being adopted in respect of network capital spending.

3.26 Table 3.6 sets out the preliminary findings of the consultants with respect to the appropriate adjustments to distribution operating costs arising out of the work on recharges.

TABLE 3.6: INITIAL ESTIMATES OF ADJUSTMENTS TO DISTRIBUTION BUSINESS OPERATING COSTS ARISING OUT OF THE ANALYSIS OF RECHARGES (1997/98 PRICES £MILLLION)

PES	**£M**
Eastern	0.0
East Midlands	(0.3)
London	(0.6)
Manweb	0.0
Midlands	(1.7)
Northern	(11.0)
NORWEB	(3.1)
SEEBOARD	0.0
Southern	(2.2)
SWALEC	(2.6)
South	0.0
Western	
Yorkshire	(0.5)
ScottishPower	(0.8)
Hydro-Electric	0.0
Total	(22.8)

Relative Costs in 1997/98

3.27 Table 3.7 combines the controllable costs shown in table 3.1 for 1997/98 with the accounting adjustments shown in tables 3.3**,** 3.5 and 3.6**.** The resulting adjusted costs vary considerably from one company to another, whether in total or expressed as averages per unit distributed or per customer connected to each network. For example, the costs per customer vary between about £30 and £85.

TABLE 3.7: ADJUSTED CONTROLLABLE COSTS (1997/98 PRICES £MILLION)

PES	Controllable Costs	Capitalisation	Allocations and Attributions	Recharges	Adjusted Costs
Eastern	150.9	0.0	(34.2)	0.0	116.7
East Midlands	145.7	0.0	(22.8)	(0.3)	122.6
London	127.9	0.0	(37.7)	(0.6)	89.6
Manweb	83.7	1.7	(21.6)	0.0	63.8
Midlands	127.8	0.0	(19.9)	(1.7)	106.2
Northern	98.9	0.0	(15.7)	(11.0)	72.2
NORWEB	128.7	3.6	(24.5)	(3.1)	104.7
SEEBOARD	81.4	11.3	(27.9)	0.0	64.8
Southern	88.4	9.4	(7.3)	(2.2)	88.3
SWALEC	75.4	0.0	(8.1)	(2.6)	64.7
South Western	74.1	0.4	(10.5)	0.0	64.0
Yorkshire	100.7	15.4	(20.4)	(0.5)	95.2
ScottishPower	100.4	2.7	(24.3)	(0.8)	78.0
Hydro-Electric	60.1	0.0	(5.8)	0.0	54.3
Total	1444.2	44.5	(280.7)	(22.8)	1185.2

3.28 In order to make costs more comparable, further adjustments have been made - for example, in respect of the higher labour costs faced by London and for the different arrangements in Scotland, where the 132 kV networks are part of the transmission business, unlike in England and Wales where they are part of distribution. Costs associated with non-trading rechargeables (NTRs), which reflect work done for third parties, have been excluded as these are not covered by the price control. Adjustments have also been made to take account of exceptional costs (one-off restructuring and other charges) and certain other one-off costs associated with the provision of data management services. DMS costs are one-off costs associated with the development of data aggregation and processing

arrangements designed to facilitate the introduction of competition for domestic customers in 1998 and 1999. The regional adjustments are summarised in table 3.8 and are explained in more detail in annex 1.

TABLE 3.8: BASE COSTS (1997/98 PRICES £MILLION)

PES	Adjusted Net Costs	Exceptionals and DMS	NTRs	Regional Adjustments	Base Costs
Eastern	116.7	(13.0)	(12.0)	0.0	91.7
East Midlands	122.6	(22.1)	(15.7)	0.0	84.8
London	89.6	(6.6)	(12.5)	(8.0)	62.5
Manweb	63.8	0.0	(3.1)	0.0	60.7
Midlands	106.2	(4.0)	(10.9)	0.0	91.3
Northern	72.2	(1.1)	(5.4)	0.0	65.7
NORWEB	104.7	(6.3)	(13.7)	0.0	84.7
SEEBOARD	64.8	4.4	(6.8)	0.0	62.4
Southern	88.3	(5.7)	(6.8)	0.0	75.8
SWALEC	64.7	(12.3)	(4.6)	0.0	47.8
South Western	64.0	(0.3)	(3.1)	0.0	60.6
Yorkshire	95.2	(12.3)	(4.3)	0.0	78.6
ScottishPower	78.0	1.2	(21.1)	5.0	63.1
Hydro-Electric	54.3	(1.1)	(2.7)	3.5	54.0
Total	1185.2	(79.2)	(122.7)	0.5	983.7

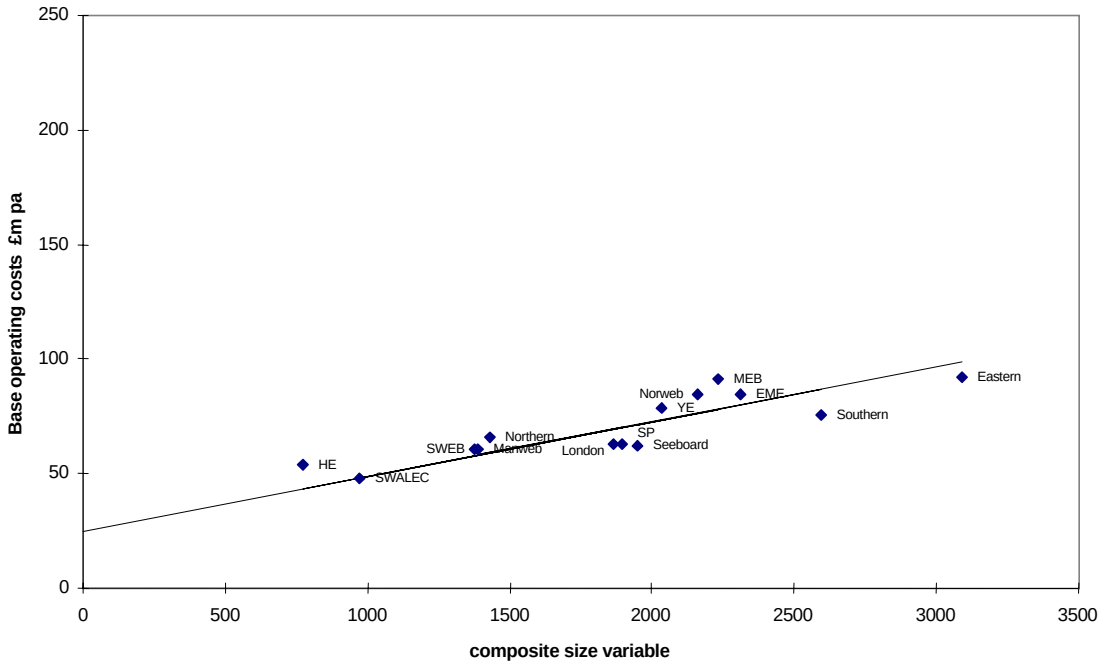
3.29 There are a number of statistical techniques which can be used to evaluate the base costs shown in Chapter 3.8. These include simple ratio analysis, regression analysis, data envelope analysis and stochastic frontier analysis. Given the relatively small sample size and the relatively large number of adjustments to the data, none of these techniques produce results which are straightforward to interpret. The comparisons set out below use regression analysis.

3.30 An important factor in determining distribution costs appears to be the pattern of peak demands at different points within each PES's system. These peaks are not easily measured and so cannot be used as a measure of the underlying factors driving costs. Any one of three observed measures - number of customers, units distributed or length of network could represent underlying cost drivers. Although these measures are correlated they have different implications for some companies. To sum up these influences a composite variable has been constructed, as set out in annex 2.

3.31 The constant term of a regression, with base costs as its dependent variable, and a composite network size measure as the independent or explanatory variable, can be thought of as representing the fixed costs of a distribution business. Initial analysis by OFFER's consultants suggests that these fixed costs should be no more than £25 million per PES. Therefore in the following analysis the constant term has been constrained to £25 million.

3.32 Figure 1 shows how base operating costs vary with the composite variable. The position of each company is indicated by a diamond and the line represents the average relationship across all the PESs, assuming fixed costs of £25 million, as discussed above. Companies shown above the line appear to have relatively high costs and those below the line appear to relatively low costs. There may be a number of factors underlying these results; including relative efficiency, the explanatory composite variable not properly capturing all the factors driving underlying costs and the adjustments to the base data set out in tables 3.7 and 3.8 requiring further refinement.

FIGURE 3.1: RELATIONSHIP BETWEEN BASE OPERATING COSTS AND THE COMPOSITE SIZE VARIABLE (1997/98 PRICES)



3.33 It is also important to consider overall efficiency, which can be assessed by considering a measure of operating costs and annualised capital expenditure against distribution business outputs. These outputs might be measured by a composite size variable and a quality of supply index. Further work will be needed to assess the appropriate quality of supply index as the price control review progresses. Nevertheless, it is possible to consider the relationship between total costs and the composite size

variable at this stage. Total costs can be calculated by adding base operating costs in 1997/98 to average network capital expenditure over the period 1990/91-1999/00, as set out in table 3.9. An average figure for capital expenditure is used to smooth the year by year volatility that can be associated with investment programmes.

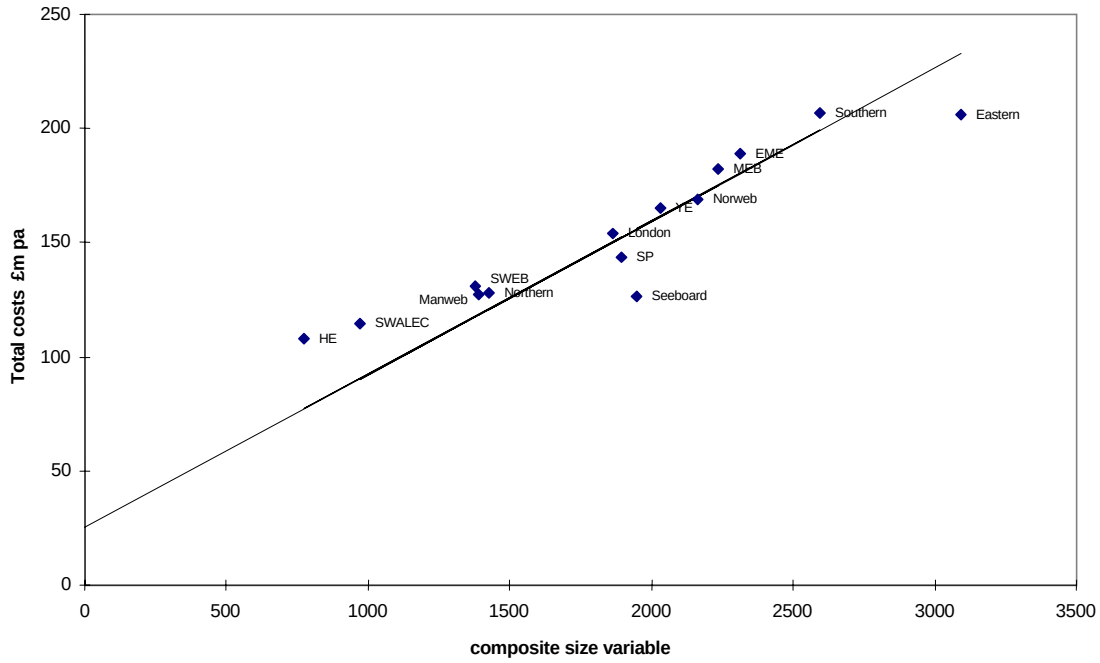
TABLE 3.9: BASE COSTS PLUS AVERAGE NETWORK CAPITAL EXPENDITURE (1997/98 PRICES)

PES	Base Costs	Annual Average Network Capital Expenditure*	Total Annual Expenditure Average
Eastern	91.7	114.3	206.0
East Midlands	84.8	104.3	189.1
London	62.5	91.6	154.1
Manweb	60.7	66.9	127.6
Midlands	91.3	91.2	182.5
Northern	65.7	62.1	127.8
NORWEB	84.7	84.1	168.8
SEEBOARD	62.4	64.1	126.5
Southern	75.8	131.0	206.8
SWALEC	47.8	66.7	114.5
South Western	60.6	70.5	131.1
Yorkshire	78.6	86.7	165.3
ScottishPower	63.1	80.6	143.7
Hydro-Electric	54.0	54.1	108.1
Total	983.7	1168.1	2151.8

* average of gross network capital expenditure spend over the years 1990 to 1999.

3.34 Figure 2 shows how the costs in table 3.9 vary with the composite variable. As with the earlier analysis there may be a number factors underlying these results, including companies' performance in terms of quality of supply.

FIGURE 3.2: RELATIONSHIP BETWEEN TOTAL COSTS AND THE COMPOSITE SIZE VARIABLE (1997/98 PRICES



Consultants' Efficiency Study

3.35 OFFER's consultants have made preliminary adjustments to the PESs 1997/98 costs in respect of capitalisation policy, allocations and recharges as described above. In addition, they have been engaged to assess the level of operating costs potentially achievable by each PES by the application of efficient operating practices. In this respect they have been assisted by the technical consultants, PB Power (formerly Merz and McLellan).

3.36 So far the consultants have assisted in the design of business plan questionnaires, analysed the completed questionnaires, visited each PES to clarify areas of uncertainty, gathered further information and asked further written questions. They are presently working on draft reports relating to efficiency in 1997/98 which will be sent to PESs for comment in due course.

3.37 In considering efficiency in 1997/98, the base year for their analysis, PKF have developed a number of benchmarks to assess PES efficiency, both in terms of operating practices and costs. Key factors influencing distribution business efficiency appear to include organisational structures, the approach to outsourcing and procurement, human resource policy, engineering policy, IT strategy and the level of corporate costs. In developing benchmarks and comparisons relating to these factors PKF are considering the following.

In respect of organisational structures the extent PESs have reduced costs by:

- introducing centralised functions;
- moving from geographic to functional structures;
- reducing the number of depots, control centres and drawing offices; and
- redesigning business processes to focus on delivering outputs at minimum costs.

Where human resource issues are concerned, the extent PESs have reduced costs by:

- introducing the multi-skilling of appropriate staff to improve productivity;
- developing flexible working and annualised working hours to increase effectiveness;
- controlling sickness and overtime levels;
- benchmarking wage rates against economy wide averages;
- reducing staff numbers; and
- delayering management structures.

In relation to engineering functions the extent PESs have reduced costs by:

- adopting condition based maintenance procedures;
- developing non-invasive maintenance techniques to streamline procedures; and
- restructuring field operations teams.

PKF are also considering the extent that PESs have developed strategies for the outsourcing, procurement and market testing of services and activities. In addition PKF are also assessing the effectiveness of IT systems and strategies.

3.38 Further details of this analysis will be published after the PESs have had an opportunity to comment and any appropriate amendments have been made.

3.39 In addition to their work on costs in the base year, PKF have also been asked to consider the factors influencing cost levels in the future and to make a projection of the efficient level of operating costs between the base year 1997/98 and 2004/05. Projections of distribution business operating costs for the period after 2000 will be published in the draft proposals, scheduled for publication in the first half of August 1999.

3.40 One factor that could have a significant impact on future costs is the level of network rates. The Department of Environment, Transport and the Regions has recently announced that the existing prescribed method of valuation will continue for at least the five year period commencing from April 2000. The implications of this in terms of future costs is presently unclear but should become apparent in the Autumn of 1999 following a Government

consultation process. Nevertheless it is possible to quantify the potential impact of any changes. In 1997/98 network rates totalled about £230 million across all 14 distribution businesses, which is around 15 per cent of total operating costs excluding depreciation and NGC exit charges. Assuming allowances for operating costs make up 50 per cent of price control revenue a 20 per cent change in network rates would change operating costs by about 3 per cent and the overall level of distribution charges by about 1½ per cent.

Issues for Consideration

3.41 Views are invited on any aspect of the issues relating to distribution operating costs, and in particular on:

- the PESs forecasts of operating costs over the period 2000/01 to 2004/05 in the light of movements in costs between 1994/95 and 1997/98 and the PESs previous forecasting record;
- the approach to adjusting operating costs for capitalisation policy, allocations, attributions and recharges;
- whether the regional adjustments to operating costs are appropriate;
- the treatment of exceptional and other one-off costs such as DMS set up costs;
- the evaluation of base costs in 1997/98, including the treatment of capital costs and quality of supply; and
- the overall approach adopted by PKF to assessing costs and relative efficiency.

4 CAPITAL EXPENDITURE

Introduction

4.1 Capital expenditure forms an important part of distribution costs and is a significant contributor to prices for customers. It is also linked to continuity and quality of supply. Before considering appropriate levels of capital expenditure for the forthcoming period, it is necessary to examine what has happened in the present price control period. The present control was set in the light of company forecasts in 1993 and 1995, and analysis and modelling work by OFFER, assisted by technical consultants. OFFER's present review is also assisted by technical consultants, PB Power. The comparison of outturn performance of companies against their own forecasts and OFFER's projections raises important questions about the treatment of capital issues. It is necessary to consider the degree of variance in the present price control period from forecasts and any systematic patterns of behaviour (for example, profiling expenditure in particular ways and whether any adjustments for under or over spend are appropriate). It is relevant to consider:

- whether the 1993 and 1995 company forecasts were credible in the light of outturn results;
- whether there is evidence of unnecessary or inappropriate capital expenditure;
- whether and to what extent companies have been able to reduce capital expenditure through improved efficiency; and
- whether quality of supply levels have been affected by companies' spending behaviour, both in the present control period and in the future (this is considered further in Chapter 5).

4.2 In making projections for the level of capital expenditure for each company for the forthcoming period, two aims will be important:

- ensuring appropriate levels of quality of supply at the lowest overall cost to customers; and
- incentivising capital efficiency and hence reductions in overall cost levels.

Background

4.3 Historically, operational capital expenditure has been treated in two parts, load related and non-load related. Load related expenditure (LRE) is associated with the connection of new customers to the distribution system and reinforcements to the existing system to accommodate general load growth. Non-load related expenditure (NLRE) relates principally to replacement of life expired assets as well as to expenditure on network control and information gathering facilities, for diversions and

environmental related expenditure and increasingly to measures to improve the quality of supply to customers.

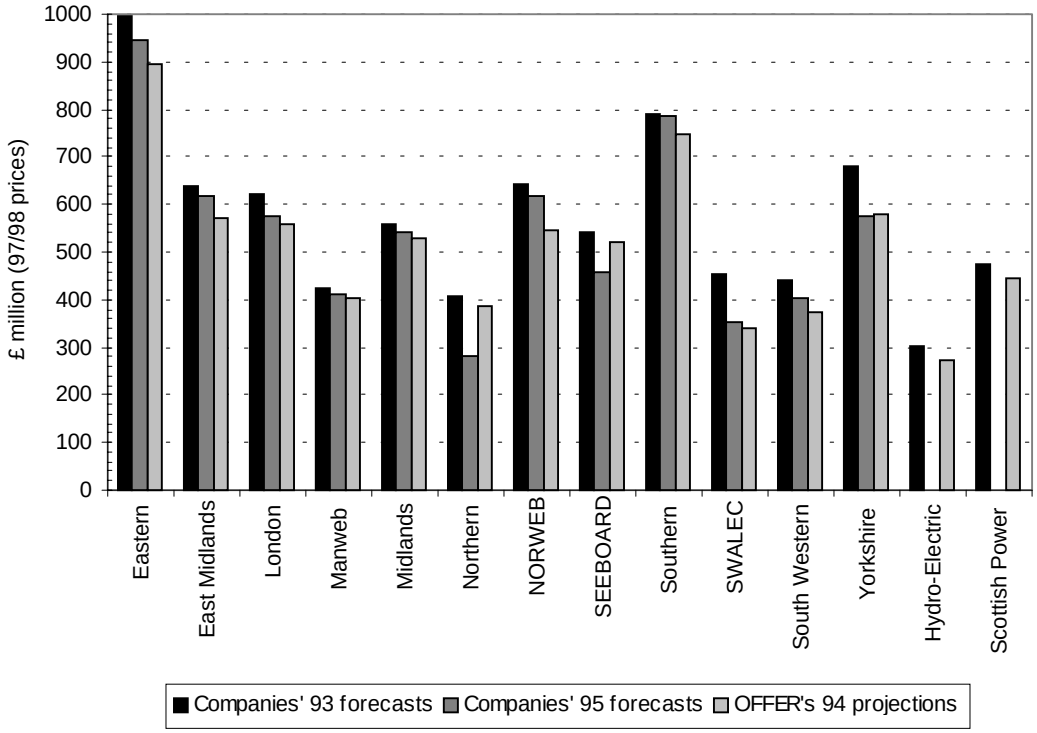
4.4 Although it is appropriate to maintain this distinction, in many cases the investment drivers will be a combination of the above factors, with network rationalisation, the replacement of ageing assets and improved quality of supply often being provided as part of a reinforcement scheme required by increasing electricity demand. Consequently the allocation of expenditure to LRE or NLRE may be somewhat arbitrary.

4.5 In general terms the drivers of LRE, namely the number and location of new customer connections and increases in electricity demands of existing customers, are outside the direct control of each company. In the case of NLRE however, in the short to medium term, the levels of investment are largely within the company's discretion, other than with respect to the relatively small proportion of expenditure associated with safety and environmental measures. As a consequence, historical pre- and post-privatisation practice has sometimes tended to result in companies balancing NLRE against LRE expenditure. For these companies, total capital expenditure appears to have been constrained to a large extent by financial and/or engineering resource restrictions.

Capital Expenditure During the Present Price Control Period

4.6 In late 1993, all companies submitted capital forecasts in respect of the years 1995 to 2000 ("the companies' 93 forecasts"). The RECs submitted revised forecasts in Spring 1995 ("the companies' 95 forecasts"). OFFER made projections for capital expenditure in respect of the years 1995 to 2000 in 1994 ("OFFER's 94 projections"). OFFER projections were retained when the price controls were set in 1995. These forecasts and projections are shown in Figure 4.1. As part of the present review, companies have submitted outturn figures for expenditure in the first three years of the present price control period and updated projections for the two remaining years ("the companies' 98 updated forecasts"). Companies have also provided forecasts for the period 2000/01 to 2004/05 ("companies' 2000 forecasts") .

FIGURE 4.1: COMPANIES' 93 AND 95 FORECASTS AND OFFER'S 94 PROJECTIONS



4.7 OFFER's 94 projections for NLRE were determined by using historical statistical information about replacement of assets, asset unit costs and asset age profile information available from the companies at that time.

4.8 In the case of LRE these projections were largely based upon a review of the companies' forecasts of new business and network reinforcement expenditure proposals and OFFER's modelling. A significant, albeit variable, part of the new business expenditure is funded directly by customers in the form of a one-off contribution. As there is now competition in the provision of connections, the price control makes allowances for LRE net of these capital contributions.

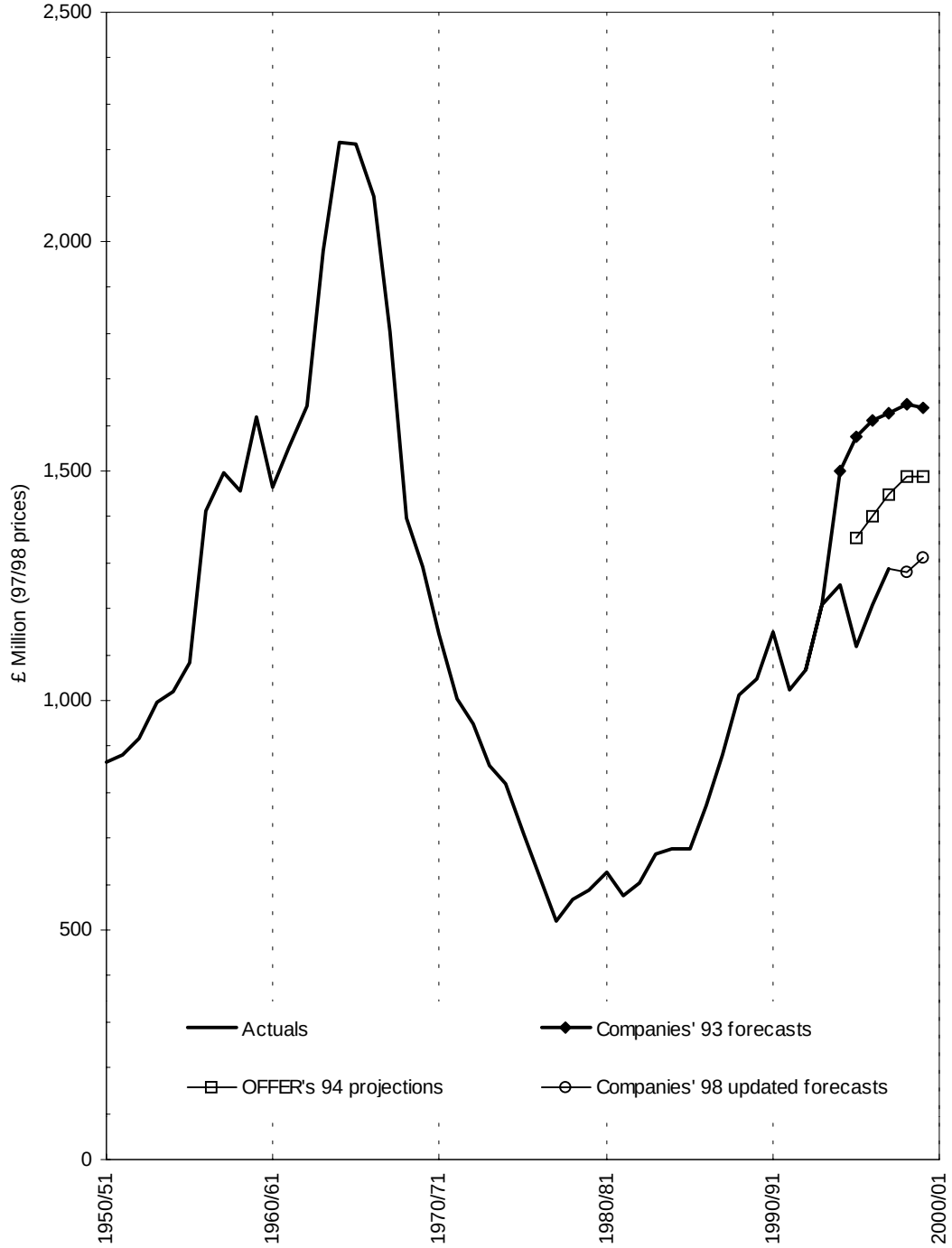
4.9 Additional sums were allowed for investments to enhance quality of supply. These sums were based on an allowance of £2 per customer per year (1994/5 prices), equivalent over the course of the price control to a total of about £300 million in 1997/98 prices. The PESs have reported a total spend in excess of £550 million aimed at enhancing quality of supply, principally reducing the duration and frequency of interruptions in power supply. Quality of supply performance in the present price control period is described in Chapter 5**.**

4.10 Despite the allowance for quality of supply enhancement measures, OFFER's 94 projections of the total levels of expenditure determined by the above process were significantly lower than the companies' 93 forecasts of

expenditure, with reductions of up to 25 per cent applying in the case of some companies.

4.11 As part of the present review, PESs have provided updated information relating to outturn and planned capital expenditure during the period 1994/95 to 1999/2000. The companies' 98 updated forecasts indicate that the companies in total are likely to underspend significantly both against OFFER's 94 projections and to a greater extent against their own 93 and 95 forecasts. The differences between the companies' 93 forecasts, OFFER's 94 projections and companies' updated 98 forecasts are put into historical context in Figure 4.2.

FIGURE 4.2: DISTRIBUTION BUSINESS CAPITAL EXPENDITURE (1997/98 PRICES)



4.12 In reviewing the PESs' submissions preliminary adjustments have been made to take account of changes in PESs' capitalisation policies during the course of this price control period. These adjustments are set out in Annex 3. They will be further reviewed and if necessary refined during the course of the review. For a number of companies, there are significant adjustments with respect to the capitalisation of underground cable repairs and IT investments. These adjustments have been made to make actual and planned expenditures more comparable.

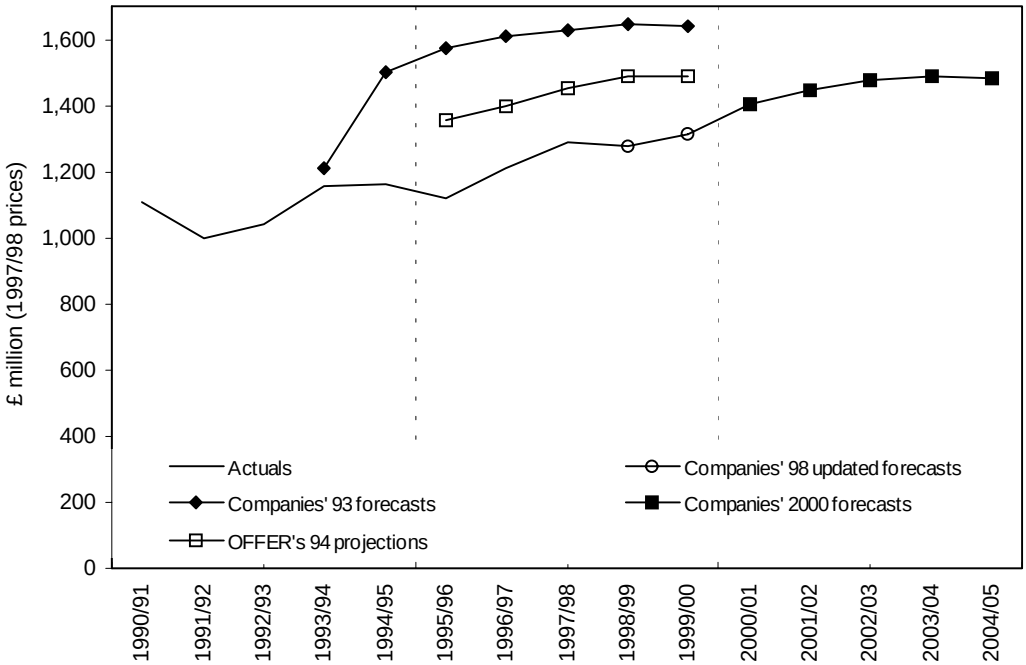
4.13 The inclusion in Figure 4.2 of the historical investment in distribution network assets is intended to assist in understanding some of the issues related to each of LRE and NLRE. The significant peak in investment during the 1950s and 60s might be thought to have implications for the future timing of asset replacement. In practice, the asset replacement investment profile should be determined by the useful lives of these assets, typically ranging between 40 and 70 years, and the extent to which certain of these assets may have become redundant or displaced by later network developments. As a consequence significant smoothing of asset replacement is anticipated and the historical expenditure peak is not expected to be repeated.

4.14 The significant trough in network capital investment during the late 70s early 80s was due to much lower demand growth rates, external financing limits in force during this period and a degree of over-investment in earlier years.

4.15 In recent years, companies have tended to extend the lives of most asset types without apparent deterioration in network performance during the present price control period.

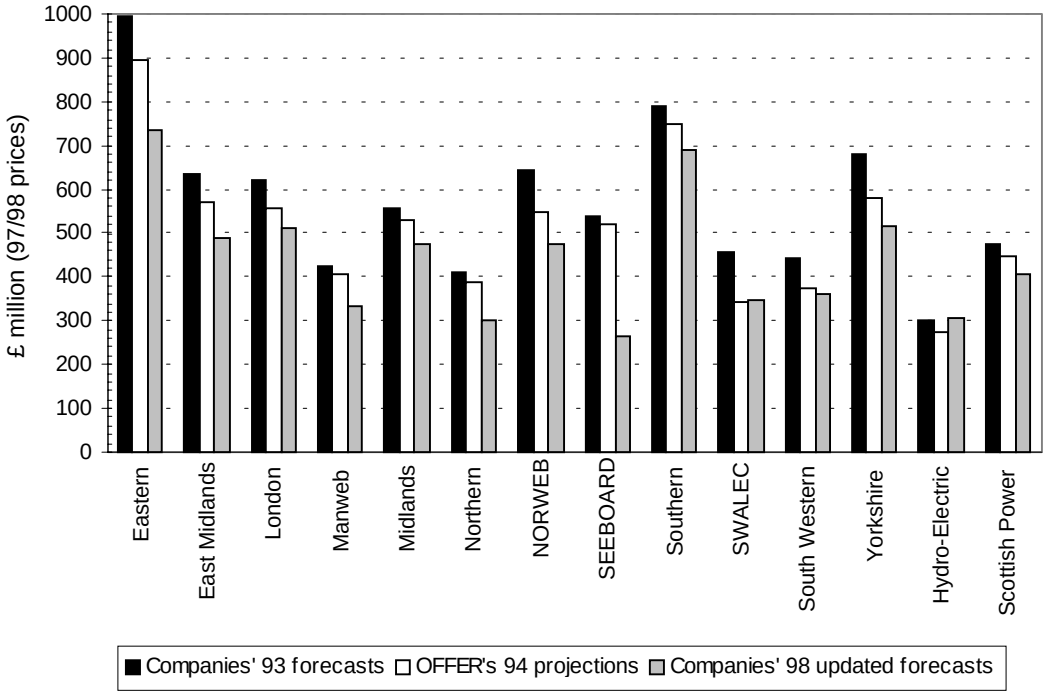
4.16 Figure 4.3 shows capital expenditure since 1990 together with the companies' 2000 forecasts. While the overall trend of companies' 2000 forecasts is for a modest increase year on year, each of the price control periods to date has been characterised by a drop in expenditure in the first years of each period, in 1991/92 and again in 1996/97, followed by a rise in expenditure towards the end of each period. This may be indicative of an incentive on the companies to delay expenditure until towards the end of the control period, thereby minimising their financing costs while maximising their asset base ahead of the next review. It strongly suggests that companies have considerable year on year discretion over expenditure levels.

FIGURE 4.3: DISTRIBUTION BUSINESS CAPITAL EXPENDITURE SINCE 1990/91 (1997/98 PRICES)



4.17 A comparison of individual companies' 93 forecasts, OFFER's 94 projections and companies' 98 updated forecasts is shown in Figure 4.4.

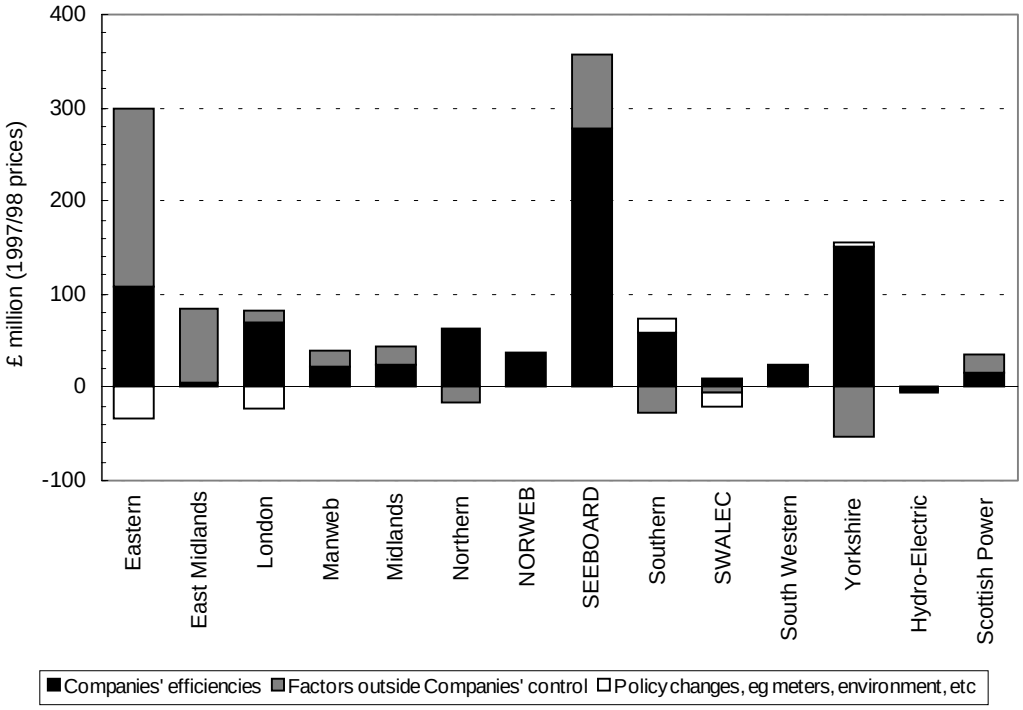
FIGURE 4.4: FORECAST, ALLOWED AND ACTUAL TOTAL EXPENDITURE 1995/96 to 1999/2000 (1997/98 PRICES)



4.18 The companies' 93 forecasts are in excess of OFFER's 94 projections, while companies' 98 updated forecasts are mostly lower than OFFER's 94 projections by up to about 50 per cent in the case of SEEBOARD. Only SWALEC's and Hydro-Electric's 98 updated forecasts exceed OFFER's 94 projections.

4.19 In general, companies have attributed variances from OFFER's 94 projections to their own efficiency measures, changes in customer requirements and other matters outside their control. They also relate to changes in company policy on metering and environmental practices. Figure 4.5 shows the PESs' explanations broken down into these three main categories. Attributions to increased company efficiency are very significant in several cases, particularly for SEEBOARD, Yorkshire and Eastern. Further analysis is required to establish the extent to which companies' claims for increased efficiency may be judged as warranted or unjustified. But as several companies have achieved substantial savings against projections, it will also be necessary to examine closely the spending performance of companies who have spent amounts close to OFFER's 94 projections. This should reveal whether OFFER's projections were more accurate in these cases or whether such companies have been relatively inefficient.

FIGURE 4.5: COMPANIES' EXPLANATIONS FOR CAPITAL EXPENDITURE VARIANCES

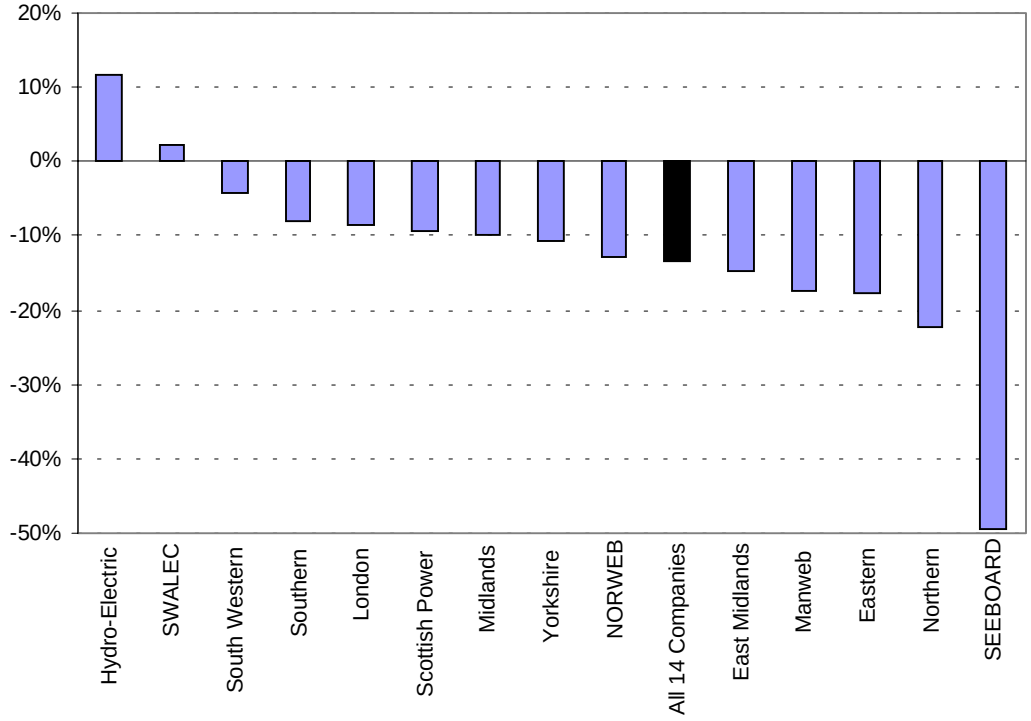


4.20 Further information on expenditure in the present price control period and an initial analysis of variances between companies' 98 updated forecasts and both companies' 93 forecasts and OFFER's 94 projections is set out below. This analysis considers total capital expenditure and variances in LRE and NLRE.

Total Expenditure Variances

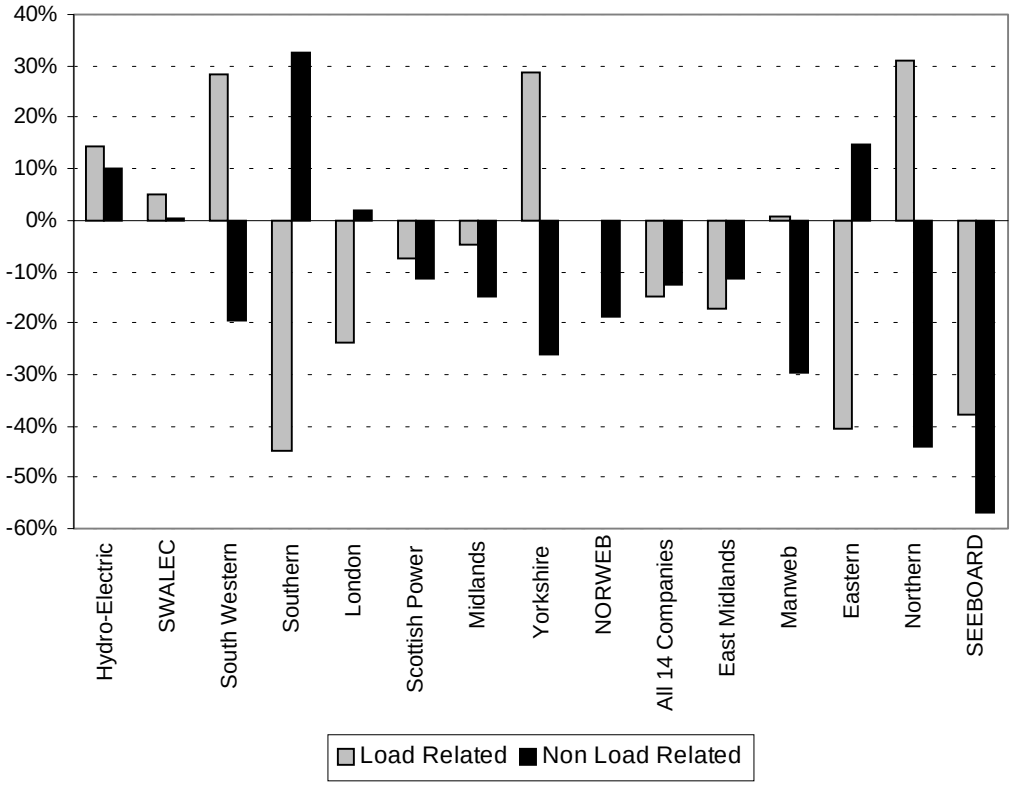
4.21 The differences between companies' updated 98 forecasts and OFFER's 94 projections, on a company basis, sorted in order of magnitude, are shown in Figure 4.6.

FIGURE 4.6: DIFFERENCES BETWEEN COMPANIES' 98 UPDATED FORECASTS AND OFFER'S 94 PROJECTIONS



4.22 Variances between outturn and projected expenditure may be explained by mis-forecasting, efficiency, changes in levels of economic activity and company discretion in chosen expenditure levels (particularly for NLRE). Figure 4.7 shows the variances of LRE and NLRE for each company. SEEBOARD, East Midlands, Midlands and ScottishPower have underspent against both LRE and NLRE projections. Southern, Eastern, Northern, South Western and Yorkshire, have significant variances of opposite signs in LRE and NLRE. Further analysis will seek to explain these variances.

FIGURE 4.7: DIFFERENCES BETWEEN LRE AND NLRE IN COMPANIES' 98 UPDATED FORECASTS AND OFFER'S 94 PROJECTIONS

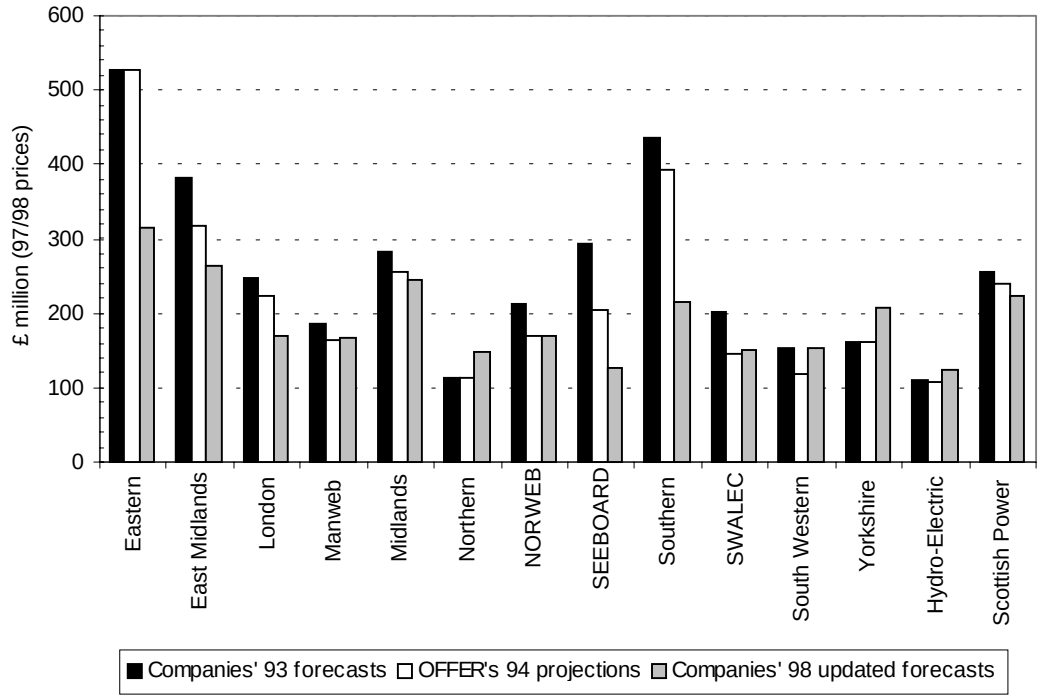


4.23 Consideration is now given to possible factors contributing to variances in LRE and NLRE in the present price control period.

Load Related Expenditure 1995-2000

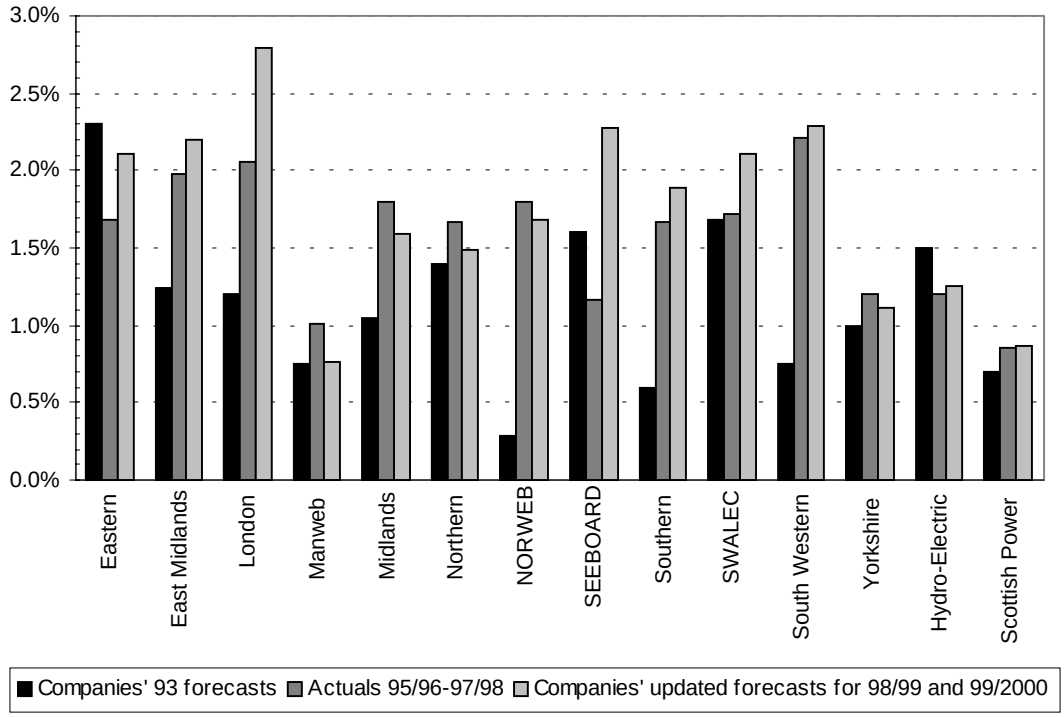
4.24 Figure 4.8 shows the differences between projected and actual LRE during the period. Eleven companies have spent the same or less than their own 93 forecasts or OFFER's 94 projections, with only Northern, Yorkshire and Hydro-Electric spending more than they projected.

FIGURE 4.8: LOAD RELATED EXPENDITURE



4.25 Load related expenditure would be expected to vary from forecasts due to differences between actual and forecast levels of economic activity in the regions, for example, growth in number of units distributed or number of new homes built. However, for most companies, actual units distributed have been higher than originally forecast, with the implication that the need for system reinforcement expenditure would also be higher. Details of the companies' 93 forecasts for the annual growth rate of units distributed, actual growth to 1997/98 and companies' forecasts of growth for 1998/99 and 1999/2000 are shown in Figure 4.9.

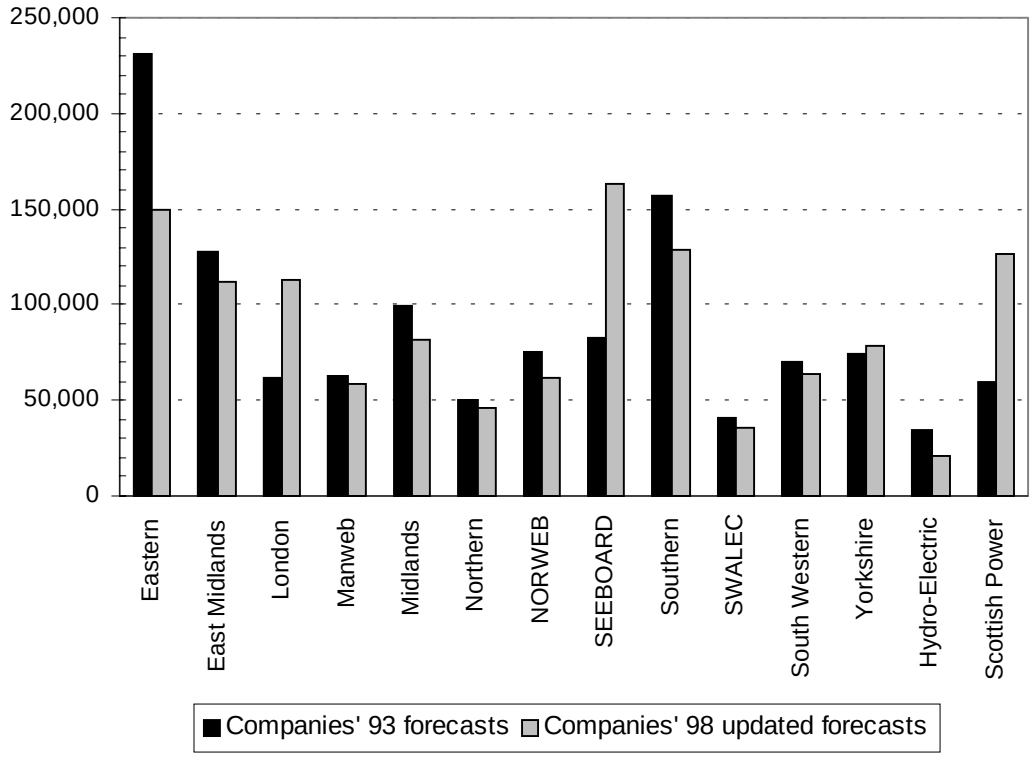
FIGURE 4.9: COMPANIES' 93 FORECASTS, ACTUAL AND COMPANIES' PROJECTED AVERAGE ANNUAL GROWTH RATE FORECASTS (UNITS DISTRIBUTED)



4.26 For many PESs there are significant differences between their original demand forecasts, upon which OFFER's projected LRE levels were largely based, and actual growth to date. Significant differences are also evident between actual growth and the companies' presently projected demand growth to the end of the present price control period. These differences may partly explain the variances between OFFER's 94 projections and companies' updated 98 forecasts for LRE levels in that certain companies reporting higher than projected LRE, namely Northern, SWALEC, Yorkshire and South Western, are also forecasting higher demand growths than originally forecast. In contrast, many of the PESs forecasting significant LRE underspend are also indicating higher than forecast demand growths.

4.27 The number of new customer connections is also relevant to LRE and in this respect too there have been variances between the companies' 93 forecasts and their 98 updated forecasts as shown in Figure 4.10. For instance, Eastern and Southern have reported fewer new distribution customers than expected, while others, notably SEEBOARD, ScottishPower and London, have about twice the number originally projected.

FIGURE 4.10: GROWTH IN CUSTOMER NUMBERS 1995 TO 2000

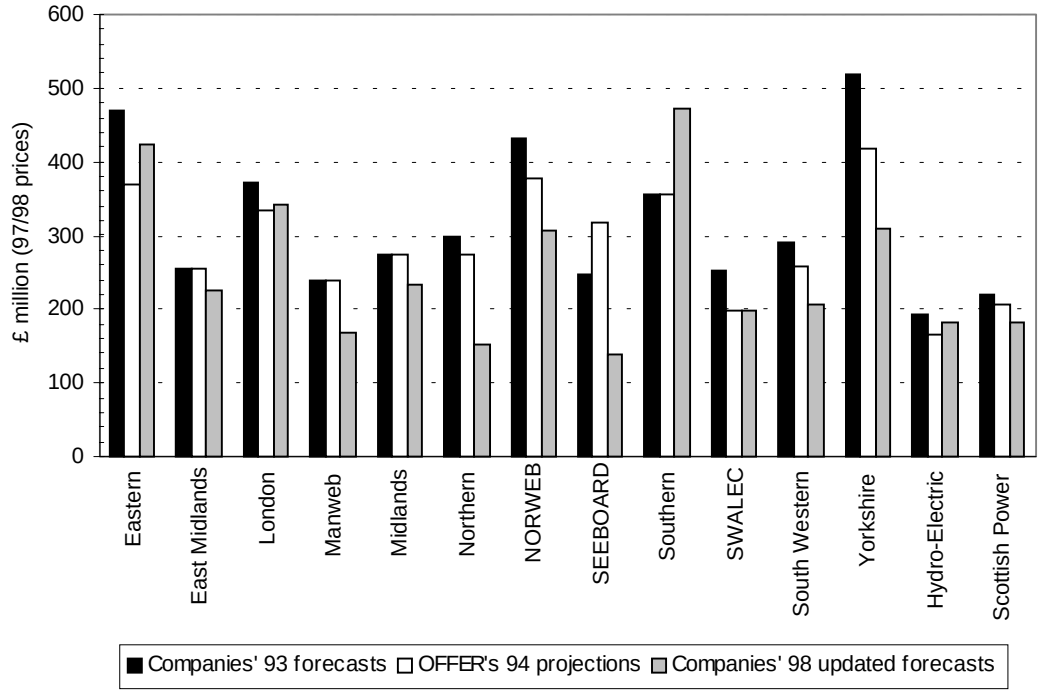


4.28 Taken together, the influence of changes in expected load growth and numbers of customers do not provide a systematic explanation for the differences between outturn and projected LRE. Further analysis continues to seek reasons for variances both in total and for individual companies. This will inform judgements about the treatment of variances in the present price control period and contribute to modelling of future LRE requirements.

Non Load Related Expenditure

4.29 Figure 4.11 shows comparisons of NLRE between companies' 93 forecasts, OFFER's 94 projections and companies' 98 updated forecasts. NLRE is generally lower than OFFER 94 projections (exceptions being Eastern, London, Southern, SWALEC and Hydro-Electric). In the case of SEEBOARD, Northern, Manweb, Norweb and Yorkshire, significant negative variances are evident, ranging up to 60 per cent.

FIGURE 4.11: NON-LOAD RELATED EXPENDITURE: PROJECTED AND UPDATED EXPENDITURE



4.30 Significant efficiencies, in excess of 20 per cent, have been claimed by companies with respect to NLRE (and LRE), principally through lower procurement costs, design efficiencies and the introduction of improved IT systems. Procurement efficiencies are claimed to have resulted from a significant opening of the supplier base, the adoption of less restrictive equipment specifications and approvals of overseas suppliers, coupled with the use of partnership type contracts. Design efficiencies have included the greater use of an integrated planning approach and the use of innovative designs. The increased knowledge of asset condition and loading levels which result from improved IT facilities has also assisted the design process.

4.31 The development of condition monitoring techniques is claimed to have allowed the deferment of the replacement of many assets, in particular transformers and underground cables, with little, if any, deterioration in network security or performance. Efficiencies are also claimed from the application of cheaper overhead line improvements, in particular selective line strengthening rather than rebuilding.

4.32 Increased spending on quality of supply has occurred within all of the companies, partly in response to OFFER's 1994 projections.

4.33 These factors are subject to review by OFFER's technical consultants. In view of the importance of the variances in NLRE, both in terms of prices for customers and the possible effects on quality of supply, careful judgements will be needed about the treatment of elements of variances in NLRE. It will also be important to quantify the effect of the factors leading to the

variances to inform the modelling of NLRE in the forthcoming price control period.

4.34 Significant differences exist between the outturn expenditure in the present price control period and both the companies' updated 98 forecasts and OFFER's projections. In some cases, the extent of savings attributed to efficiency appears large and will be examined in detail. It is inappropriate for companies to benefit from these savings where underspending is judged to jeopardise quality of supply. If the current incentives are not felt to be sufficiently strong or explicit, it may be appropriate to increase penalties for degradation in quality of supply. Similarly, overspends will be subjected to careful scrutiny so that customers do not bear the cost of unwarranted excess expenditure.

Capital Expenditure in the Period from 2000/01 to 2004/05

Analysis of Company Forecasts

4.35 Companies' 2000 forecasts will be critically examined against the criteria of obtaining maximum capital efficiency and therefore lowest prices for customers while ensuring that quality of supply is maintained or improved.

4.36 This examination will build on the analysis used during the last price control review and will address the following points:

- whether the companies' 2000 forecasts can be expected to reflect underlying needs taking into account experience in the present price control period;
- what stance should be adopted for companies which project increased expenditure in future;
- whether companies which forecast continuing low spending in future are putting quality of supply at risk; and
- the extent to which good practice identified in the present price control period should be embodied into OFFER's projections.

4.37 The companies' 2000 forecasts are higher than their 98 updated forecasts. These increases are summarised in Table 4.1, taking into account recent changes in company capitalisation and capital cost allocation policies.

TABLE 4.1: COMPARISON OF COMPANIES' 2000 FORECASTS OF CAPITAL EXPENDITURE WITH 98 UPDATED FORECASTS (£MILLION)

	£M at 1997/98 prices		
	Load-related	**Non-load related**	**Total**
Companies' 2000 Forecasts	2963	4328	7291
Companies' 98 Updated Forecasts	2673	3537	6210
Increase	290 (+10.8%)	791 (+22.41%)	1081 (+17.4%)

4.38 The differences between companies' 98 updated forecasts and 2000 forecasts are shown in Figure 4.12 and Figure 4.13 Significant differences are evident between the individual companies with Eastern and East Midlands (40 per cent) and NORWEB (80 per cent) forecasting the need for major increases in expenditure, while SWALEC and Yorkshire forecast reductions of about 10 per cent.

FIGURE 4.12: CHANGES IN TOTAL CAPITAL EXPENDITURE BETWEEN 2000-2005 AND 1995-2000

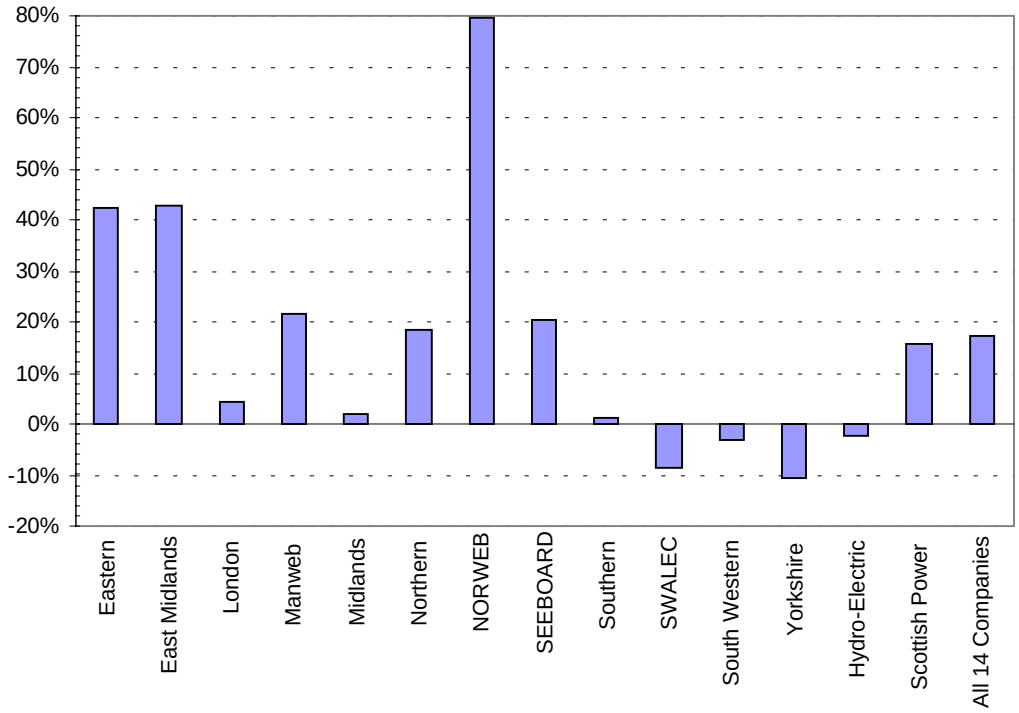
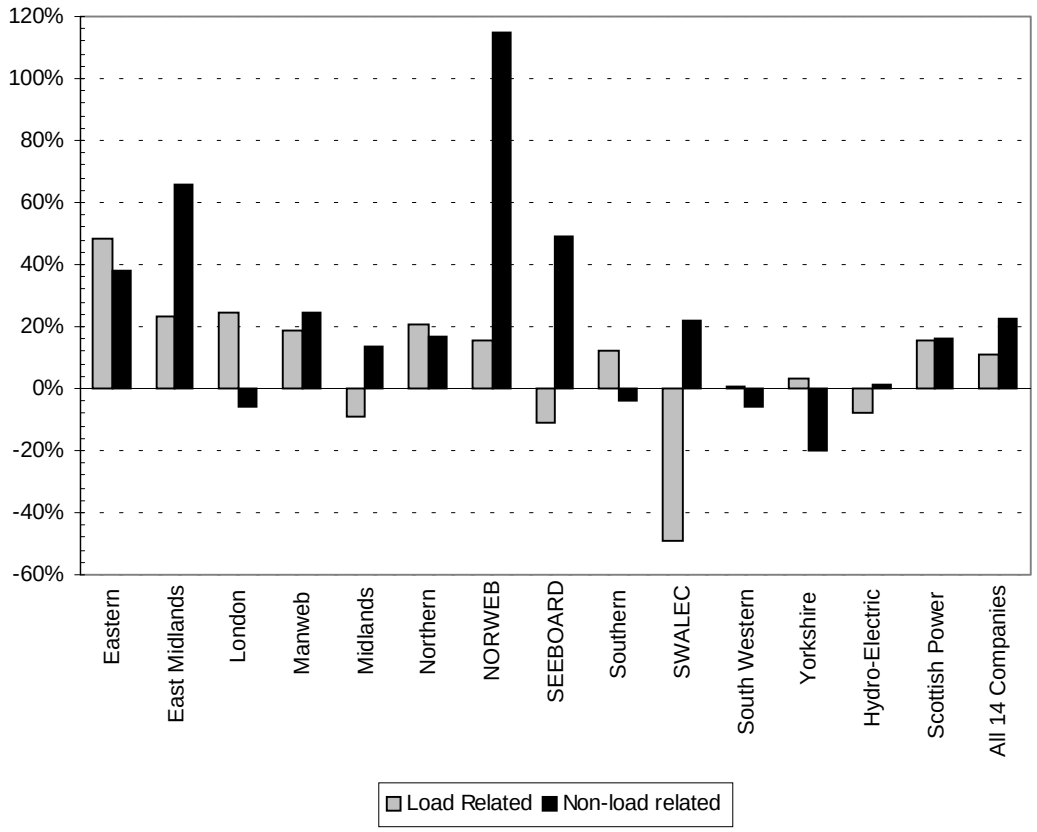


FIGURE 4.13: CHANGES IN LRE AND NLRE BETWEEN 2000-2005 AND 1995-2000



4.39 Companies' 2000 forecasts are being subjected to detailed study, both on an overall basis and for each company.

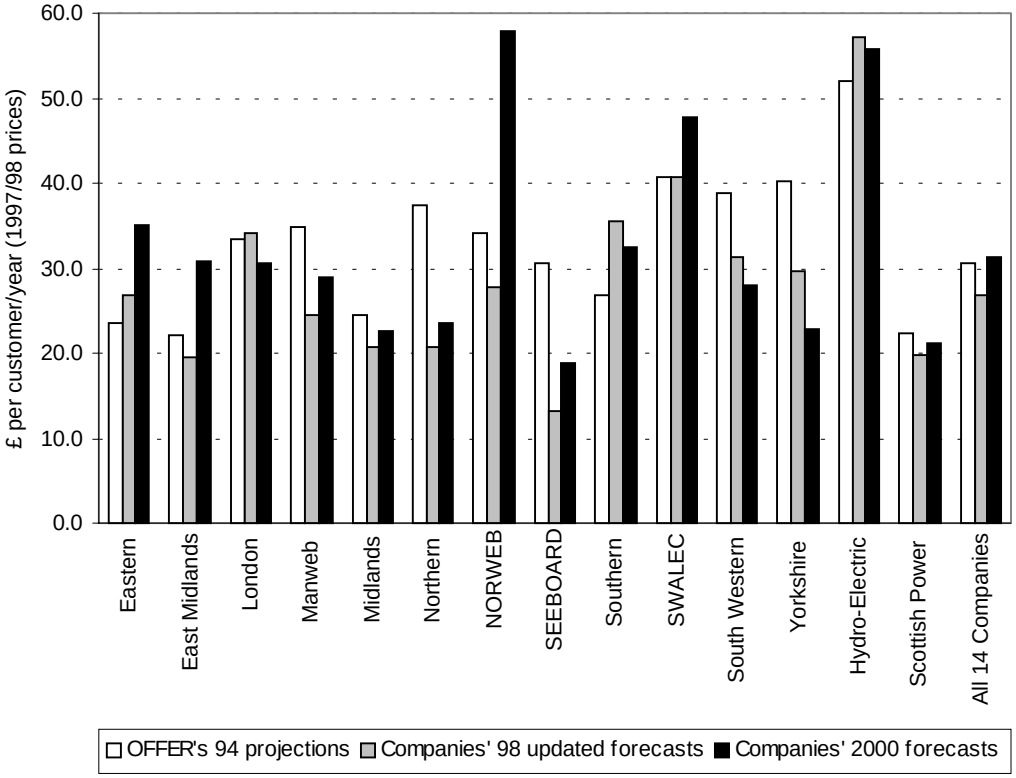
Load Related Expenditure Modelling

4.40 In modelling LRE, it is necessary to identify and take into account the main expenditure drivers. These include underlying demand growth, numbers of new connections and also movement of demand within a network, or churn. It may also be necessary to recognise differences in LRE costs arising from characteristics of the companies' areas.

Non Load Related Expenditure Modelling

4.41 Figure 4.14 shows comparisons between the rate of NLRE implied by companies' 98 updated forecasts for the present control, and companies' 2000 forecasts for the next period, normalised by numbers of customers. It shows that on average NLRE is forecast to increase by about 10 per cent over the present period. A number of companies are indicating significant reductions against both OFFER's 94 projections and companies' 98 updated forecasts although these are counterbalanced by significant increases which are forecast by other companies. The largest increase belongs to NORWEB, which forecasts that NLRE will approximately double from the present level.

FIGURE 4.14: AVERAGE NON-LOAD RELATED EXPENDITURE PER CUSTOMER PER YEAR



4.42 As for LRE, modelling of NLRE will build upon techniques used in the previous reviews, and experience of development in asset management during the present period. Much better information is also available for the present review about companies' asset age profiles, unit replacement costs and replacement practices. Taken together, these factors should allow more robust analytical modelling of future NLRE needs.

Issues for Consideration

4.43 There has been a significant divergence of company behaviour with respect to capital expenditure in the present price control period, and companies' forward projections show continuing divergence. An important feature of this review will be how to deal with these divergences on a consistent and robust basis against an objective of encouraging companies to provide appropriate levels of quality improvement at the lowest cost. Views are invited on any aspect of the issues raised in this chapter, and in particular on:

- the extent to which past underspends can be justified on the basis of efficiency savings or relate to mis-forecasts or changes in factors outside companies' control;
- the extent to which capital expenditure has been unnecessarily high or inappropriate in the present price control period;

- the extent to which companies have distorted the phasing of capital expenditure programmes and what should be done about this;
- determination of appropriate levels of load-related expenditure for the forthcoming price control period;
- determination of appropriate levels of non-load related expenditure for the forthcoming price control period; and
- in determining the above, the extent to which longer term considerations of asset replacement or possible deterioration in quality ought to be included in considerations of capital expenditure, or whether these are more properly addressed through revisions to quality output standards and the penalties for failing to meet these.

5 QUALITY OF SUPPLY

Introduction

5.1 Quality of supply covers reliability (continuity) of supply and voltage fluctuations. Quality of supply performance derives from the design of the network and the way in which the network is operated, maintained and renewed. PESs' licences require them to design the network to certain minimum standards; incentives to operate and maintain networks to give adequate quality of supply to customers come from Standards of Performance set by OFFER. There are two sources of annual reporting about quality of supply. The first is OFFER's Report on Distribution and Transmission System Performance which includes data on network performance in terms of numbers and duration of supply interruptions. The second is OFFER's Report on Customer Services which includes performance data on a range of customer service measures under the Standards of Performance including some which relate directly to quality of supply.

5.2 The main existing measures of continuity of supply and associated Overall and Guaranteed Standards of Performance are:

Index	Description	Standard
Security	Supply interruptions per 100 connected customers	
Availability	Minutes lost per connected customer (CML)	
Restoration of Supply	Percentage of supplies restored within 3 hours	OS1a
	Percentage of supplies restored within 24 hours	OS1b & GS2
Overall Reliability	Number of faults per 100 km of distribution system (mains only)	

5.3 One of the principal objectives of this price control review is to ensure that customers receive appropriate levels of quality of supply, with improvement as necessary, at minimum cost. This chapter considers how quality of supply has developed in the present price control period; how much has been spent with a view to enhancing quality; and whether the benefits gained were commensurate with those costs. The results of this initial analysis will inform the choice among possible approaches to quality of supply in the forthcoming price control period. It will be important to

establish a robust framework for quality of supply in the future including setting clear and appropriate targets, ensuring the availability of sound data about quality and setting appropriate penalties for companies who fail to meet quality standards.

Performance in the Present Price Control Review

5.4 Although the last price control review included an assessment of the Overall and Guaranteed Standards of Performance, it included few other explicit provisions relating to quality. Since then several factors have emerged which have influenced companies' approaches to quality.

5.5 Hydro-Electric rejected the 1994 price controls proposals and, following an MMC enquiry, a revised distribution price control was put in place. The MMC projections allowed the company additional capital expenditure for refurbishing and replacing parts of Hydro-Electric's distribution system and established a target for improvement in quality of supply.

5.6 In 1995, OFFER published a paper which required the companies to develop targets for quality of supply. These included measures similar to those proposed by the MMC for Hydro-Electric. OFFER's 95 proposals required the companies to:

- publish annual quality of supply reports providing more detailed and disaggregated information;
- set their own targets for improvements in quality of supply including quantified targets for reductions in supply interruptions and customer minutes lost;
- set their own quantified target for improvement to the quality of supply for worst-served customers and a quantified target for reduction in the number of transient interruptions suffered by customers; and
- provide information on investments in improvements in quality of supply.

5.7 After a period of consultation, OFFER tightened the Overall Standards in 1998. The minimum standard for restoration of supplies within 3 hours (OS1a) was increased from 80 to 85 per cent. The minimum standard for restoration of supplies within 24 hours, OS1b, was set at 100 per cent for all companies.

System Performance since 1990

5.8 System performance as measured by security and availability, together with the companies' targets for 1999/2000 are presented in tables 5.1 and 5.2. These tables were included in the July 1998 Consultation Paper but have been updated to include more recent information from companies. Data in these tables includes interruptions from all sources, including those resulting from periods of severe weather and planned interruptions resulting from companies' maintenance activities.

TABLE 5.1: SECURITY OF SUPPLY: INTERRUPTIONS PER 100 CUSTOMERS

	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	Company target for 1999/2000
Eastern	76	68	96	59	65	85	89	74	70
East Midlands	169	82	75	92	96	97	95	93	87
London	41	47	38	36	40	33	39	39	30
Manweb	82	74	86	89	70	62	57	57	50-60
Midlands	170	110	129	125	121	139	148	132	109
Northern	108	90	87	80	89	90	89	90	85-90*
NORWEB	58	62	57	56	70	61	60	84	55
SEEBOARD	98	90	139	87	91	83	80	91	82
Southern	80	81	82	78	75	79	79	73	70
SWALEC	285	229	195	214	220	223	192	186	189
South Western	146	129	118	119	124	116	106	106	87
Yorkshire	158	69	72	71	85	86	93	80	55
ScottishPower	70	71	83	58	61	65	57	73	55-65**
Hydro-Electric	176	204	135	178	176	193	146	153	147*
Customer-Weighted Average	111	88	95	85	88	91	89	88	77

* Revised targets as stated in response to Business Plan Questionnaire, November 1998

** Revised target as stated in Quality of Supply Report 1997/98

TABLE 5.2: AVAILABILITY OF SUPPLY: MINUTES LOST PER CUSTOMER

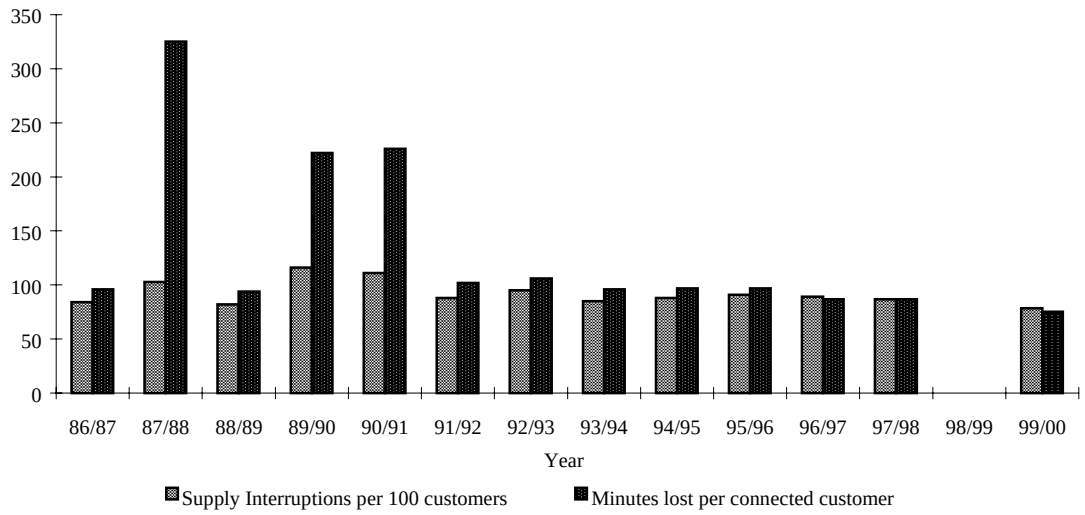
	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	Company target For 1999/00
Eastern	76	65	91	63	94	85	77	70	66
East Midlands	1,004	87	87	97	105	95	79	82	73
London	51	67	53	52	58	54	56	50	40
Manweb	185	108	129	121	102	88	78	97	65-75
Midlands	398	118	122	144	128	151	126	116	86
Northern	246	97	102	102	95	86	82	87	93*
NORWEB	88	75	77	69	70	67	66	96	64
SEEBOARD	101	86	106	75	83	69	82	92	60
Southern	104	109	91	74	78	78	67	56	60
SWALEC	330	325	212	200	212	233	189	183	191
South	185	176	184	167	133	111	103	108	93
Western	175	60	59	61	69	62	60	59	56
Yorkshire	85	76	98	77	70	81	89	77	65-75**
ScottishPower Hydro-Electric	172	270	356	254	233	365	206	219	210
Customer-Weighted Average	226	102	106	96	97	97	87	88	75

* Revised target as stated in response to Business Plan Questionnaire, November 1998

** Revised target as stated in Quality of Supply Report 1997/98

5.9 Trends in security and availability indices are shown in Figure 5.1**.** There are peaks in the availability index caused by the hurricane in October 1987 and the winter storms in 1990 and 1991. Data for the last seven years show some evidence of a slowly improving trend. Company targets for improvement by 1999/2000 represent typical reductions in the above indices of the order of 10 and 15 per cent from 1994/95 levels.

FIGURE 5.1: DISTRIBUTION NETWORK QUALITY OF SUPPLY PERFORMANCE



Notes:
1 Outturn data for 1998/99 not available.
2 1999/2000 levels represent the overall average target levels.

5.10 Present indications are that most, but not all, companies are likely to achieve their 1999/2000 targets. On present indications, Midlands, SEEBOARD and ScottishPower are unlikely to achieve their own 1999/2000 targets for improvements in security (numbers of interruptions) and availability (duration of interruptions). London is unlikely to meet its own security improvement target. Midlands and SEEBOARD have improved their data collection systems recently and this has resulted in an apparent deterioration in their reported performance. SEEBOARD claim that this has made its performance worse by around 10-15 per cent.

5.11 In addition to considering national trends in quality, it is useful to consider how companies have performed in comparative terms during the present price control period.

5.12 In doing this, it is necessary to take account of different features of each company's network. One way to do this is by normalising performance for system length.

5.13 Figures 5.2 and 5.3 show for 1997/98 the number of interruptions and minutes lost arising from distribution high voltage (HV) networks plotted against HV network length per customer.

FIGURE 5.2: SECURITY PERFORMANCE

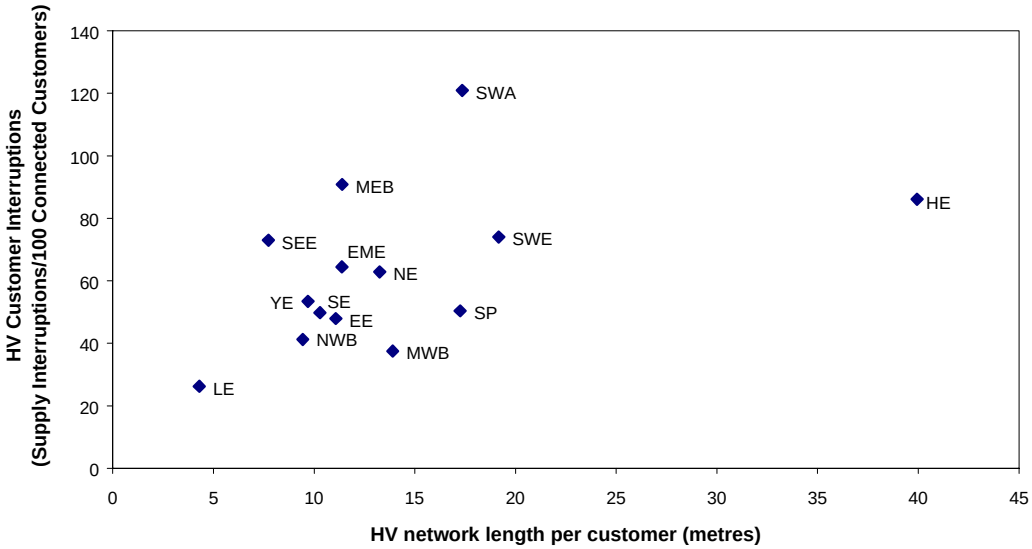
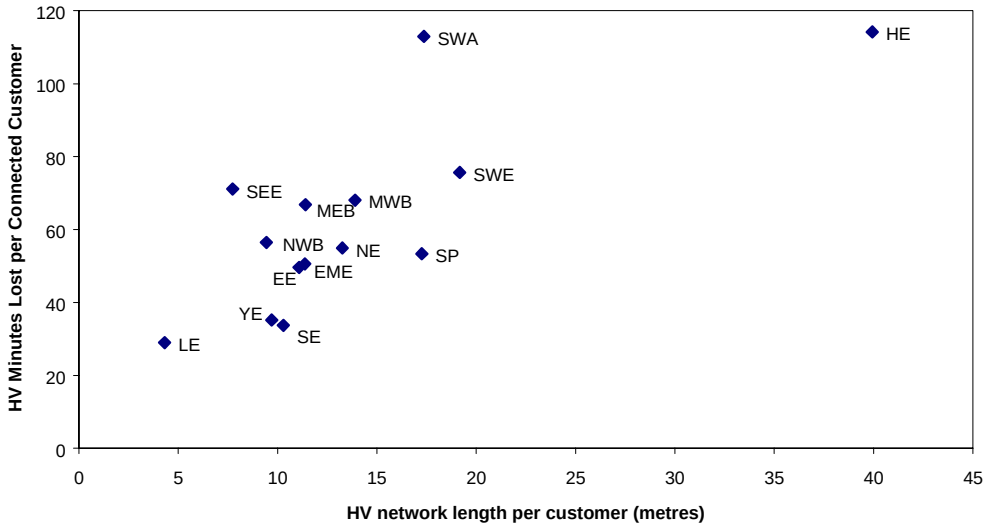


FIGURE 5.3: AVAILABILITY PERFORMANCE



5.14 Figure 5.2 shows that Midlands, SEEBOARD and SWALEC have relatively high numbers of customer interruptions in relation to the length of their HV network though this may have been influenced by changes to Midlands' and SEEBOARD's reporting systems mentioned earlier. In both Figures 5.2 and 5.3 Hydro-Electric is an outlier in terms of HV network length per customer.

5.15 It will be important to develop this analysis as the review progresses. If greater use is to be made of performance targets in the next price control period, it will be important to ensure that the companies' data collection systems are more reliable and consistent.

Company Approaches to Quality of Supply in the Present Price Control Period

5.16 During the present price control period, companies have approached quality improvement in several different ways. This section considers how companies have addressed the requirements to publish Quality of Supply Reports, set targets and provide information on investment. Taking each of these factors in turn:

(i) Quality of Supply Reports

The content and presentation of Quality of Supply Reports vary although the reports do contain some useful information not readily available before. However, in some cases the Reports have not achieved the objectives specified in OFFER's October 1995 Quality of Supply paper. For example few companies have been able adequately to describe performance for worst-served customers or performance with respect to transient interruptions. It is for consideration whether more stringent reporting requirements should be introduced, perhaps with a common format to aid comparison and understanding of companies' approaches to quality improvement.

(ii) Targets for Security and Availability Indices

The companies were invited to set targets in terms of annual percentage improvements for security and availability of supply, and were left discretion in the degree and manner of improvement. As a result the targets for security and availability indices vary significantly. Hydro-Electric's target is a percentage reduction in HV faults, from a historical 10 year average in 1993/94. Some companies have used averages of historical performance indices as the base figures, excluding outlying years. Two companies have declared relatively broad ranges for their security and availability targets. Another company has set its availability target in terms of faults only (that is, excluding planned outages). Another company's targets exclude the effects of severe weather. There are also some differences between targets as originally declared in Quality of Supply Reports and those declared more recently in the companies' business plans.

It is for consideration whether future targets should be set on a common basis and whether the influence of year-on-year variations may be taken into account by using rolling averages of a number of years' data. A particular issue is the manner in which account should be taken of the effects of severe weather, both in setting target indices and reporting performance. In our view the effect of severe weather should be retained, both in the setting of targets and reporting of system performance.

(iii) Targets for Worst-served Customers

Worst-served customers are those experiencing a relatively high number of interruptions per year and in their Quality of Supply Reports companies have in general identified an associated number of poorly performing HV circuits. The level of interruptions above which priority would be given for remedial action differs, with four to six interruptions per year being typical levels; one company does not expect to set a target until 2003; another "considers it inappropriate to specify targets for each year". Some companies have indicated target levels for either the maximum proportion of customers or number of circuits experiencing a given number of interruptions per annum; in some cases these target levels are expressed as averages over a period of years. It is for consideration whether common targets should be introduced in this area and at what level of performance.

(iv) Targets for Reducing Transient Interruptions

Many companies are only in the early stages of monitoring transient interruptions (short-term interruptions of between 1 second and one minute's duration). As a result, little meaningful information has become available on this subject through Quality of Supply Reports and no robust targets have been set. The importance of monitoring and improving transient interruptions appears questionable at present, particularly in the light of customer views reported later in this chapter.

(v) Expenditure on Quality of Supply in the Present Price Control Period

Table 5.3 shows reported capital expenditure on quality of supply measures in the present price control period.

TABLE 5.3: REPORTED AND FORECAST CAPITAL EXPENDITURE ON QUALITY OF SUPPLY 1997/98 PRICES (£MILLION)

Company	Capital Expenditure on Quality of Supply Measures 1995/96 to 1999/2000 £M
Eastern	101.6
East Midlands	9.5
London	36.7
Manweb	12.3
Midlands	7.6
Northern*	36.3
NORWEB	35.4
SEEBOARD	18.1
Southern	103.6
SWALEC	14.6
South Western	47.0
Yorkshire	23.1
Hydro-Electric**	96.8
ScottishPower	17.4
Total	560

Notes:
* Quality of Supply Report 97/98.
** Expenditure on refurbishment of EHV/HV overhead lines, following MMC Report.

Although there is a wide range of reported expenditures in Table 5.3 which may indicate differences in reporting policies, it appears that over £550 million will have been spent on quality of supply during the present price control period. This corresponds to about £4 per customer per year. At the time of the last price control a sum of about £2.30 per customer at today's prices was included in capital expenditure allowances for quality of supply measures.

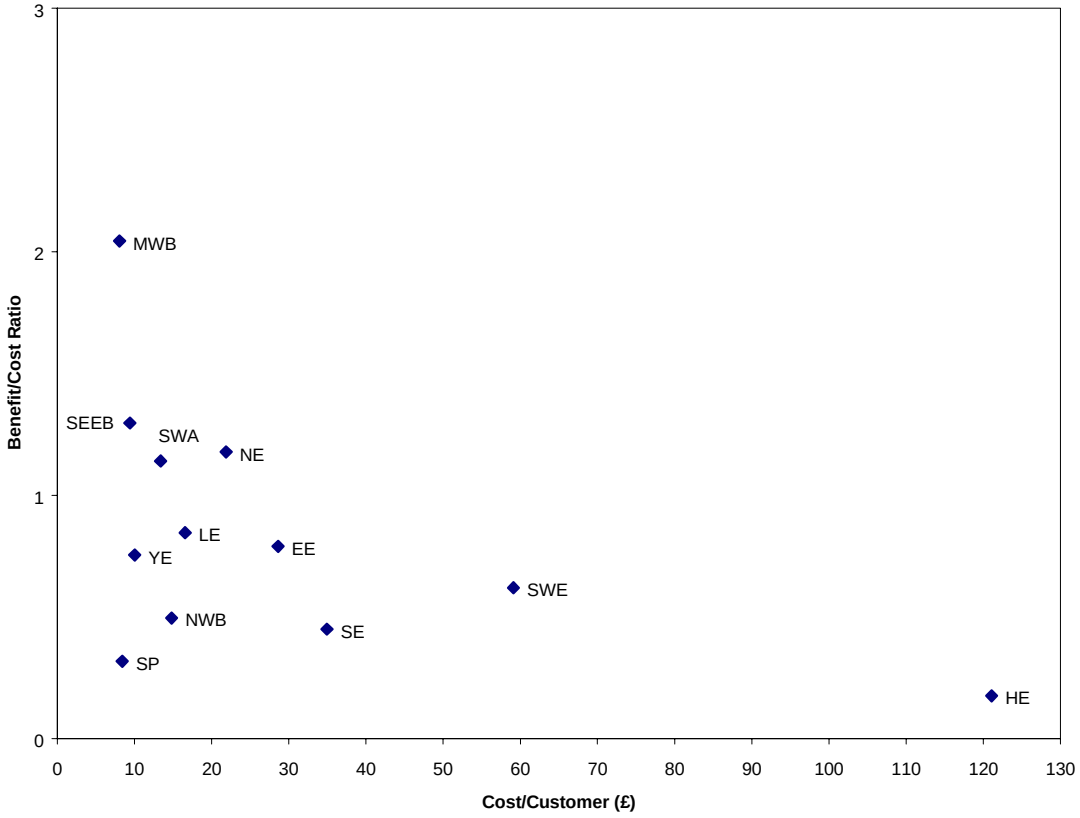
Economic Evaluation of Quality Measures in the Present Price Control Period

5.17 The July 1998 consultation paper discussed linking revenue to performance. In doing this, it is important to consider the value to customers of improvements in quality of supply. One published method of evaluating improvements in quality of supply is in terms of savings in

System Customer Outage Costs (SCOCs) as presented in two papers written by authors from UMIST [1, 2]. Annex 4 describes the techniques used.

5.18 Figure 5.4 shows an analysis of the capitalised costs (including operating

FIGURE 5.4: BENEFIT/COST RATIOS OF QUALITY MEASURES 1995/96 TO 1999/2000



costs) and benefits of the quality of supply measures introduced in the present period. The benefits have been evaluated in terms of savings in SCOCs and the costs and benefits have been capitalised over a 20 year period from 1995/96.

5.19 The programmes of improvements have been assumed to start in 1995/96 and to be completed in 1999/2000. The system performance indices (Security and Availability) used as the basis for the evaluation are the company target indices and not the actual indices.

5.20 The figure excludes the results for East Midlands and Midlands which have declared relatively low expenditures for quality measures. As a result they are outliers in terms of benefit/cost ratios.

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[1] Kariuki, K.K. and Allan R.N.: 'Assessment of customer outage costs due to electric service interruptions: residential sector', IEE Proc. *C*, 1996, **143**, pp.163-170.

[2] Kariuki, K.K. and Allan R.N.: 'Evaluation of reliability worth and value of lost load', IEE Proc. *C*, 1996, **143**, pp.171-180.

5.21 The quality of supply programmes for Manweb, Northern, SEEBOARD and SWALEC appear to be cost-justified using this method of calculation. Those of Eastern, London, NORWEB, Yorkshire and ScottishPower do not appear to be cost-justified although the capitalised cost per customer is low. Southern, South Western and Hydro-Electric have programmes that do not appear to be cost-justified and which have a relatively high capitalised cost per customer.

5.22 For these three companies:

Southern says that it has a major programme to improve network reliability including extensive replacement of existing main 11 kV overhead lines with new lines using insulated conductors, addition of pole-mounted switchgear such as auto-reclosers, extensive replacement of LV bare conductor lines with aerial bundled conductor, and 11 kV urban automation. However, Southern's performance in terms of customer minutes lost has already exceeded its 1999/2000 target. Taking this into account would improve the value for money assessment of Southern's programme.

South Western identified in its Business Plan some £47 million of capital expenditure and some £23 million of operating costs spent on measures to improve network reliability during the current period. Most of the expenditure relates to 11 kV overhead lines but may also be accounted for as asset replacement expenditure; hence the expenditure used in the evaluation may be high. The level of South Western's operating costs for quality measures is much higher than that estimated by other companies.

Hydro-Electric's programme for improving network performance is based on extensive refurbishment of 11 kV overhead lines against a set performance target, as agreed following the MMC referral. The low benefit/cost ratio reflects the high cost of achieving the targets through refurbishment measures alone.

Conclusions on Quality of Supply Measures in the Present Price Control Period

5.23 There has been a modest improvement in average quality of supply levels during the present price control period. Some quality of supply initiatives appear to be cost-justified on the basis of the SCOC calculation reported above. The review of present performance has highlighted shortcomings in the way companies report on quality measures and expenditure, and the way in which targets are set.

Quality of Supply in the Forthcoming Price Control Period

5.24 Several lessons have emerged from considerations of quality in the present price control period. Overall a more rigorous approach to measuring, specifying and evaluating quality is indicated. It will be important to consider proposals for companies' preferred approaches to quality, responses to specific quality initiatives set out in OFFER's July 1998 Consultation Paper and an independent survey of customer views. These are considered in turn below.

5.25 OFFER asked companies to submit proposals for their preferred approach to quality improvement together with a base case in which no quality improvement is anticipated. OFFER also asked them to evaluate and cost a range of specific quality of initiatives:

- 12 hour restoration target for GS2 and OS1b - tightening the existing target of 24 hours to 12 hours;
- OS1a - increase percentage of interruptions restored within 3 hours by 3 percentage points;
- new standards for worst served customers;
- new standard for telephone response times; and
- new requirement to underground 5 per cent of HV overhead lines network by 2004/2005.

5.26 Companies' detailed responses on these issues were included in OFFER's December 1998 consultation paper. Each issue is considered in turn below.

Introduction of 12-hour restoration target for GS2 and OS1b

5.27 Companies say that the introduction of such a target for GS2 and OS1b would markedly increase costs to restore the last few remaining customers within the target time.

OS1a - Increase Percentage of Interruptions Restored within 3 hours by 3 percentage points.

5.28 Companies generally oppose such a tightening of the standard. As overall network performance is improved by measures designed to reconnect large groups of customers affected by higher voltage system faults more rapidly, the percentage of customers remaining affected by faults on lower voltage systems with slower restoration times is increased. As a result, some companies say that OS1a is already given perverse incentives, tending to discourage cost effective improvements at higher voltage levels. It is for consideration whether the standard should be revised in the light of these concerns.

New standard for maximum number of interruptions for worst served customers

5.29 OFFER proposed consideration of a new standard requiring 99.5 per cent of customers to experience not more than three interruptions per annum. Companies responded that the means of measuring such performance may not be in place and that there may not be economic justification for such a standard. Companies will be required to put in place arrangements to monitor the number of interruptions in supply to worst served customers. The level of a new standard and an appropriate date for its introduction are for consideration.

Telephone Response Times, 90 per cent within 15 seconds (normal) and 80 per cent within 30 seconds (exceptional)

5.30 Companies' estimates of expenditure to achieve this standard are generally small and it is likely that a new standard of this type will be appropriate.

5.31 Consideration needs to be given to whether the defined response time is a measure of the time taken to give a substantive response, or simply an acknowledgement from a recorded message service.

Undergrounding

5.32 Most companies said that less undergrounding than the proposed five per cent of the overall system would be appropriate. It is for consideration whether a small amount of undergrounding should be included in the projections of capital expenditure.

Findings of Customer Market Research Survey, February – March 1999

5.33 OFFER commissioned MORI to carry out market research on customers' attitudes to quality of supply in early 1999. The survey included 2029 domestic and 503 business customers and was skewed slightly to ensure that the final sample included at least 500 rural domestic customers.

5.34 The survey covered:

- customers' expectations of supply reliability and the value placed on a secure supply;
- awareness of present standards and payment levels and views on improving/extending standards or setting new ones;
- whether companies should make payments under Standards following supply failure for reasons beyond the company's control, such as severe weather;
- whether payments under the Guaranteed Standard for supply interruption should be made automatically by the company, without the customer having to claim;

- importance to customers of undergrounding lines - for reasons of reliability and/or environmental benefits, and how much they would be prepared to pay;
- customer views about the adequacy of companies' telephone responses during supply interruptions;
- whether and, if so, how to set standards for the number and duration of supply interruptions;
- customers' attitudes to the other specific quality initiatives identified earlier.

5.35 The main findings of the market research were:

- over 93 per cent of customers surveyed were satisfied with their reliability of supply; for domestic customers, the overall level of satisfaction has not changed since the 1997 survey;
- there was little spontaneous support for investment in network improvement – about two-thirds of domestic and business customers do not feel that there should be more investment in quality of supply. Nevertheless, very few of those surveyed would be interested in reducing the overall standards of quality of supply in return for lower bills;
- despite this, when asked particularly about the specific quality initiatives, domestic customers appeared ready to pay for some improvements. Business customers are more interested in seeing improvements made, although they are proportionately no more willing to pay for these than domestic customers.
- just over 40 per cent of domestic customers and about half of business customers would pay anything more for better quality in general terms;
- individual improvements to standards are attractive to certain customers who indicated a willingness to bear extra costs. Customers gave a wide range of acceptable extra costs with median values of about:

Domestic	£5
Business	2% of bill

- most attractive improvements to standards appear to be :

  - automatic Guaranteed Standards payments following supply failures and a reduction in the period after which payments are due from 24 to 12 hours (domestic and business customers);
  - a three per cent increase in supplies restored in three hours (business customers);
  - improvements which reduce the number of power cuts, followed by their length. While around one-third of all customers have experienced transient power cuts (less than one minute) in the last two years, the majority do not find them particularly inconvenient.
  - undergrounding overhead lines (domestic and business customers). One in three domestic customers said that they would pay an extra

£5 per year to see more lines put underground. Qualitative research indicated that customers support this idea for both quality of supply, and environmental reasons.

5.36 Despite opposition to the concept in qualitative research, a majority of both business and domestic customers accepted that the exemption of electricity companies from penalty payments during severe weather is fair and reasonable.

Evaluating Improvements in Quality of Supply

5.37 Using a similar method to that adopted earlier in this chapter for historical quality improvements, an analysis has been performed of the possible benefits of companies' proposals for improving quality in the forthcoming price control period.

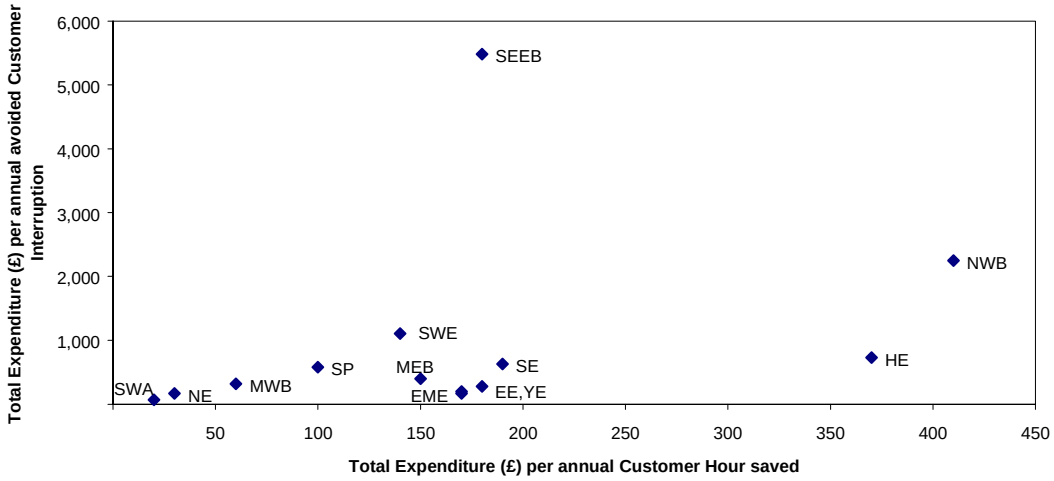
5.38 The total life-cycle costs of the improvements are assessed by discounting:

- capital expenditure for each of the years 2000/01 to 2004/05; and
- operation and maintenance costs for each of the years 2000/01 to 2019/20;

5.39 London has been excluded from this comparison as it has not forecast any improvement in the number of customer interruptions. SEEBOARD has forecast a range of improvements for its security and availability targets; the averages of these ranges have been used in this analysis. Hydro-Electric's specific costs and improvements are calculated from the combination of its base and quality measures cases, including a continued programme of overhead line refurbishment in response to the 1995 MMC enquiry.

5.40 Figure 5.5 shows the relative costs of reducing the number of interruptions and reducing the length of interruptions. The comparison shows Hydro-Electric, NORWEB and SEEBOARD as overall outliers, reflecting relatively modest performance improvements forecast despite substantial proposed expenditure. Northern Electric and SWALEC show the lowest specific costs for given improvements.

FIGURE 5.5: COMPARISON OF SPECIFIC COSTS OF IMPROVEMENTS 2000/01 TO 2004/05



5.41 Figure 5.6 shows the benefit/cost ratios as a function of the total (capitalised) life-cycle costs per customer. The companies fall into a number of groups:

(a) low benefit/cost ratios and low costs per customer (Eastern, London, Manweb, SEEBOARD, Southern, Yorkshire and ScottishPower), reflecting:

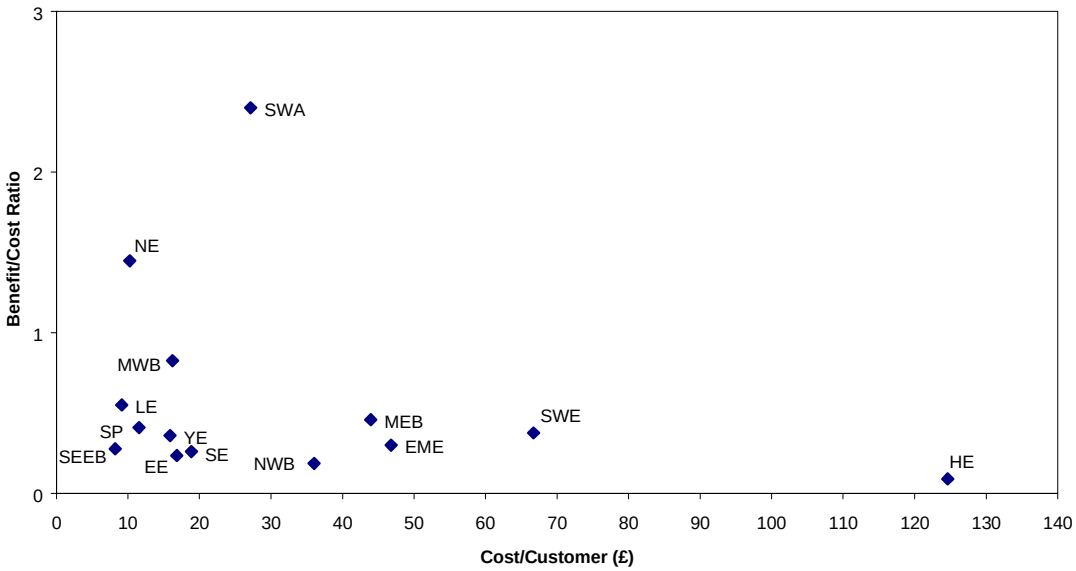
- the general policies of these companies to target worst-served customers in preference to pursuing improvements in overall security and availability indices; and/or
- low improvement in overall indices set against a forecast increase in numbers of customers and energy distributed (which imply an increase in SCOC and a lower benefit/cost ratio).

(b) high benefit/cost ratios and low costs per customer (Northern, SWALEC), reflecting quality measures programmes of relatively low cost resulting in appreciable forecast improvement in performance.

(c) low benefit/cost ratios and high cost per customer (East Midlands, Midlands, NORWEB, and South Western) although East Midlands has a base case which appears to include quality measures; and

(d) benefit/cost ratio less than break-even (unity) and very high costs per customer (Hydro-Electric) reflecting the high costs of obtaining improvements in system performance through a programme based primarily on the refurbishment of overhead lines.

FIGURE 5.6: BENEFIT/COST RATIOS OF QUALITY IMPROVEMENT MEASURES 2000/01 to 2004/05



Initial Conclusions on Quality of Supply

5.42 The present price control includes a capital expenditure allowance of £2.30 per customer per annum in today's prices for quality of supply measures. This amount is similar to that which most companies report that their own customers indicate they would be prepared to pay. It is also of the same order as that indicated in the 1999 market research survey (about £5). An annual amount of £2.30 per customer corresponds to an expenditure of £276 million over 5 years, which is about 42 per cent of the sum of the additional capital expenditures (£655 million – excluding Hydro-Electric) in the companies' preferred Quality Measures Cases for the forthcoming price control period.

5.43 Against this background, it appears that expenditure of the same order as that included in the present price control may continue to be appropriate subject to the imposition of performance improvements targets and other appropriate changes to Guaranteed and Overall Standards. Supplementary targets for improvements in quality for worst-served customers are indicated. In addition, market research shows that customers are not prepared to accept reductions in quality levels. This suggests that new and significant penalties should be applied where quality of supply levels fall below acceptable standards.

Issues for Consideration

5.44 Views are invited on any aspect of the issues raised in this chapter, and in particular on:

- the use of a common basis for reporting quality improvements and expenditure;
- the robustness of measurement techniques available to companies for recording quality performance;
- the imposition of robust targets for quality improvement, covering both modest improvements in overall quality of supply and measures for worst-served customers;
- the timescales over which such targets might be introduced;
- the inclusion of capital expenditure allowances which relate specifically to quality improvement;
- the requirement to make Guaranteed Standards payments automatically and whether the severe weather exemption remains appropriate;
- the reduction of the period of interruption after which a Guaranteed Standards Payment is due from 24 to 12 hours (perhaps with a similar reduction in the level of payment); and
- the introduction of a new standard relating to telephone answering performance.

6 FINANCIAL ISSUES

Introduction

6.1 The July 1998 consultation paper set out a framework for the analysis and assessment of financial issues as part of the distribution price control review. This involves establishing an asset base and estimating a return equivalent to the cost of capital on this asset base. Other regulators and the MMC have adopted similar approaches in setting price controls. As a supporting check on these calculations it is necessary to consider the financial position of each distribution business and PES, and the path of distribution charges in the short and long term. In general, respondents to the July 1998 consultation paper supported this approach, although a number of respondents suggested that the method for calculating the asset base might distort the incentives between operating and capital expenditure. As noted in chapter 2 it will be important to ensure that the revised price controls provide PESs with the incentives to seek out both operating and capital efficiencies.

6.2 This chapter starts with an assessment of the cost of capital and then deals with issues relating to asset valuation and the path of distribution charges in the short and long term. It then discusses the sort of supporting checks that it might be appropriate to carry out on the financial position of each distribution business and PES.

Cost of Capital

6.3 The level of return that is required by the financial markets is called the cost of capital. The cost of capital is usually calculated as a weighted average of the cost of debt and equity finance. As well as providing a return on debt and equity companies must also finance corporation tax payments. The cost of capital can be adjusted to provide an allowance for corporation tax.

(i) Gearing and the Weighted Average Cost of Capital

6.4 Companies can be financed by both debt and equity. The proportion of debt to debt plus equity is referred to as gearing. In calculating an average cost of capital it is necessary to make an assumption about gearing. Gearing also influences the cost of both debt and equity finance. It will be appropriate to assume that companies have reasonably efficient levels of gearing to encourage financial efficiency and protect the interest of customers.

6.5 Debt finance is usually cheaper than equity finance. There are two main reasons for this: debt holders have a prior claim on the distribution of a company's income ahead of equity holders and so face lower risk; and debt can be a tax efficient form of finance. In these circumstances companies may be able to reduce their weighted average cost of capital (WACC) by increasing the proportion of debt finance. However, increasing gearing will tend to put some upward pressure on the underlying cost of both debt and equity finance. At higher levels of gearing a company may no longer be able to access debt finance at a reasonable cost. If these relatively high levels of gearing are reached, then the advantages of debt in terms of tax management are likely to be more than offset by the higher levels of debt premia. This suggests that there is some notional level, or more likely a range, of gearing at which the WACC is minimised. This range will reflect an efficient capital structure.

6.6 The MMC has tended to base its calculations of the cost of capital on the actual rather than the efficient level of gearing. This approach was also adopted by OFFER in the 1996 price control review of NGC's transmission business. However, the circumstances of the PESs are significantly different to those of NGC. The PESs were privatised in 1990 and 1991, and the sector has undergone a significant amount of financial restructuring and take-over activity. In these circumstances, management has had the opportunity to influence the financing structures supporting each distribution business. It is appropriate to take account of this in coming to a judgement on the cost of capital as part of the distribution price control review. Therefore, it will be appropriate to assume that the distribution businesses are financed by reasonably efficient capital structures. It will also be appropriate to make uniform assumptions across all companies. This is consistent with the overall approach to setting the distribution price control discussed in chapter 1, where customers are required to fund only the efficient costs of operation and those companies with above average efficiency benefit from this relative to less efficient companies.

6.7 In determining the efficient level of gearing, it will be necessary to consider the impact of increasing gearing on the cost and availability of debt and equity finance, and focus on the position of the PES rather than the wider group.

6.8 Specialist credit rating agencies assign rating grades to individual debt issues by assessing the degree of credit risk. These ratings are reviewed on a regular basis. Those rating categories that represent the lowest risk are classified as investment grade, indicating suitability for a wide range of investors. Ratings representing higher risk are classified as speculative, indicating suitability only for limited types of investor. In consequence, there is a marked difference in the ease of access to and cost of debt finance for speculative grade borrowers. Having regard to his statutory duties, the DGES has modified the licences of certain PESs, and is now in the process of modifying others, so as to require each PES to maintain an investment grade credit rating on its debt. This condition is calculated to secure that

each PES manages its affairs as to maintain access to a wide range of sources of finance, readily and at reasonable cost. It will be reasonable to take this requirement into account in assessing the appropriate level of gearing.

6.9 The two main credit rating agencies are Moody's and Standard and Poor's, their minimum investment grade categories being Baa3 and BBB- respectively. Table 6.1 shows that at present a number of PESs have credit ratings above the minimum investment grade level. These credit ratings reflect a range of factors, nevertheless, they suggest that many PESs have the scope to increase gearing.

TABLE 6.1: CREDIT RATINGS ASSOCIATED WITH PES DEBT IN THE FIRST QUARTER OF 1999

PES	MOODY'S	STANDARD & POOR'S
Eastern	A3	BBB +/A-2
East Midlands	A1	A/A-1
London	Baa2	BBB-/A-3
Manweb	Not rated	Not rated
Midlands	Baa1	A-1-
Northern	A3	BBB+/A-2
NORWEB	A1	A+/A-1
SEEBOARD	A3	A-/A-2
Southern	Aa3	A+/A-1
South Western	A3	A-/A-2
SWALEC	A3	A-/A-2
Yorkshire	Baa1	BBB+/A-2
ScottishPower	Aa3	A+/A-1
Hydro-Electric	Aa3	A+/A-1

6.10 In 1998/99 Hyder (the group of companies of which SWALEC is a part) had a level of gearing around 50 per cent and its debt retained its investment grade credit rating (Baa- and BBB+ with Moody's and Standard & Poor's respectively).

6.11 In an October 1997 report on various utility companies Warburgs suggested that gearing levels of about 50 to 60 per cent would be consistent with an efficient capital structure for companies owning distribution businesses.

6.12 A survey of institutional investors conducted by Credit Lyonnais Securities Europe (CLSE) in October 1998 indicated that an average gearing level of between 50 and 60 per cent would be the maximum acceptable level for the water and sewerage companies that would be commensurate with maintaining an investment grade credit rating for debt.

6.13 In its October 1998 consultation paper 'Prospects for Prices' OFWAT has assumed a level of gearing of between 50 and 60 per cent for water companies. In its December 1998 document on the financial framework for the review of Railtrack's access charges, ORR has assumed a level of gearing between 40 and 50 per cent.

6.14 The available evidence suggests that PES gearing levels in the range 50 to 60 per cent would be consistent with their debt maintaining its investment grade status. The calculations set out later in this chapter are based on an assumption of 50 per cent gearing, which should allow the PESs some headroom to increase gearing during the period of the next price control if circumstances dictate that this is necessary.

(ii) The Cost of Debt Finance

6.15 The cost of debt finance can be thought of as having two components, a risk free component and a company-specific risk premium.

6.16 Although the real risk free rate is not directly observable, it is possible to derive an estimate from the return available on UK Government index linked gilts (ILGs) and treasury bills. Respondents to the July consultation paper, including PESs, supported the use of ILGs for estimating the real risk free rate.

6.17 Table 6.2 summarises average redemption yields on ILGs over the last ten years. Since early 1997, redemption yields on ILGs have fallen significantly and present redemption yields are at historically low levels. In response to the July 1998 consultation paper, a number of PESs suggested that the fall reflects temporary economic or financial market conditions, not a long term shift, and that a more appropriate estimate of the real risk free rate would be based on an average of redemption yields over time.

TABLE 6.2: AVERAGE REDEMPTION YIELD ON ILGS WITH FIVE YEARS OR MORE TO MATURITY (ASSUMING 3 PER CENT INFLATION)

Year	%
1990/91	4.22
1991/92	4.22
1992/93	3.89
1993/94	3.21
1994/95	3.84
1995/96	3.61
1996/97	3.61
1997/98	3.30
1998/99	2.40
1999/00	1.80*

* Estimate for the financial year based on present spot rates

6.18 In its December 1998 report on Cellnet and Vodafone, the MMC estimated a range for the real risk free rate of between 3.5 and 3.8 per cent. In deriving this range the MMC took account of both recent and longer-term historical evidence. The MMC argued that "focusing too narrowly on the current spot rate would run the risk of setting an inappropriate cost of capital if, as history suggests is likely, real interest rates rise from their current low level" (Appendix 5.6, para 7). It also noted that this range was consistent with that used by the MMC in previous reports following regulatory inquiries, notably the MMC's 1997 report on NIE.

6.19 In recent consultation papers both OFWAT and ORR set out estimates of the real risk free rate based on the current rates of redemption yields on ILGs. In its March 1999 paper OFWAT stated that "highly liquid and well analysed financial markets provide the most efficient and best informed view of the trend of future interest rates and stock prices".

6.20 The longer that lower redemption yields on ILGs persist the more persuasive becomes the argument that these lower yields are not simply a feature of short-term market conditions. Nevertheless, it will be important to bear in mind the argument made by the MMC suggesting it would be inappropriate to focus too narrowly on current spot rates. The average redemption yield on ILGs over the last two years has been about 2 per cent, and the average over the last three years 2½ per cent. This suggests a range for the risk free rate of 2 to 2½ per cent.

6.21 It may be appropriate to take into account that a reasonably efficient capital structure would have required the PESs to have increased debt significantly since the last price control review. In 1995/96, and 1996/97 the average redemption yield on ILGs was about 100 basis points higher than over the period 1997/98 to 1999/00. If a PES issued one third of its debt in the first

two years of the present price control period this would increase the overall cost of debt by about one third per cent.

6.22 The debt risk premium reflects the additional return required by the providers of debt finance to hold corporate rather than government debt and can be estimated as a premium over the real risk free rate. It will depend on a number of company specific factors including the company's level of gearing and its overall financial position, the size and liquidity of the debt issue and its maturity, and wider economic factors. These factors are assessed by credit rating agencies. As explained in the previous section it will be appropriate to assume that PES debt maintains its investment grade status.

6.23 At present spreads of Baa/BBB rated bonds over the comparable gilt are around 150 basis points. However, as with the risk free rate it will also be appropriate to take account of averages over the last five years**.** This suggests a range between 100 and 150 basis points, giving a 1¼ per cent estimate for debt premia.

6.24 Taking 2 to 2½ per cent as the estimate for the real risk free rate, one third per cent adjustment for historic debt and a debt premium of 1 and 1¼ per cent gives a real cost of debt finance in the range 3.3 to 4.1 per cent.

(iii) The Cost of Equity Finance

6.25 Respondents to the July consultation paper, including PESs, generally supported the use of the capital asset pricing model (CAPM) to estimate the cost of equity capital, although some respondents also suggested that the Dividend Growth Model (DGM) should be used as a supporting check on the results produced by CAPM. There was no support for the use of other methods to estimate the cost of equity finance such as the Arbitrage Pricing Theory.

6.26 CAPM derives an estimate for the cost of equity finance by adding an estimate of the real risk free rate to an estimate of the appropriate equity risk premium (ERP). Estimating the real risk free rate is discussed in the section on the cost of debt finance. In estimating the appropriate ERP two factors are taken into consideration, the ERP for the market as a whole and the riskiness of the company relative to the market. The appropriate method of estimating the ERP for the market as a whole has been the subject of considerable debate. This has mainly focused on whether the ERP should be based on observing historic returns, surveying investors' expectations or combining estimates of dividend yields with real dividend growth.

6.27 In its report on Cellnet and Vodafone, the MMC concluded that the most reliable estimate of the expected future ERP would be based on averages of historic returns. The MMC suggested that over shorter periods of time both the real risk free rate and equity premia exhibit significant volatility. The MMC estimated that real equity returns have averaged between 7 and 8.3 per cent. Together with its estimated range for the real risk free rate of 3.5 to 3.8 per cent, the MMC's implied range for the ERP was 3.2 to 4.8 per cent. Taking this into account, the MMC concluded that a range of between 3.5 and 5 per cent would be appropriate for the ERP, consistent with the ranges used in previous MMC reports.

6.28 In recent consultation papers both OFWAT and ORR indicated that they estimated the ERP by reference to present expectations rather than historic information. In its October 1998 paper OFWAT indicated that there "is broad agreement that the wide range of historical estimates of the ERP are of questionable relevance and all significantly overstate the current expectations of actual equity investors". OFWAT used a range of between 2.75 and 3.75 per cent, while the range used by ORR was between 3 and 4 per cent. OFWAT has reaffirmed its views since the publication of the MMC report on Cellnet and Vodaphone.

6.29 The survey of institutional investors published by CLSE in October 1998 suggested that, after adjusting for inflation, the ERP is in the range 2.7 to 4.5 per cent. In its September 1998 report on electricity companies, Merrill Lynch noted that some fund managers have started to use estimates of the ERP as low as 2 to 3 per cent. In a November 1998 report on the water sector, Commerzbank quote an equity risk premium for the market of about 3 per cent. In an October 1997 report on the cost of capital, SBC Warburgs used 3½ per cent as an estimate of the ERP.

6.30 Based on the available evidence a range of between 3 and 4.2 per cent for the ERP appears appropriate. This is consistent with the bottom half of the MMC's range for the ERP, and appears to take account of present City and investor expectations.

6.31 An indication of the specific riskiness of a company relative to the market is given by the beta coefficient. This aims to predict the extent to which a company's share price would tend to change in response to changes in the level of the overall market, and seeks to measure a company's non-diversifiable risk relative to equities generally. Beta estimates are usually based on historic data, for example, the London Business School (LBS) publishes beta values estimated on monthly observations over a five year period. It is debatable whether such estimates accurately reflect the markets forward looking expectations of risk. Nevertheless, it is worthwhile to consider the information that is available on beta estimates.

6.32 Since the last distribution price control review most of the PESs have been taken over. This raises the question of how best to estimate beta values for distribution businesses, as most of the share price data that is available relates to larger groups of companies, many of which are under US ownership. It might be appropriate to consider beta estimates for a range of UK utility companies. Table 6.3 shows estimates of various utility company betas. Although there are important differences in the nature of these companies and in the risks to which each are exposed, there are important similarities, namely the operation of a network business (or businesses) that contribute a major part of group earnings. The table shows that there is a relatively wide range in the level of equity betas across these companies. One reason for the variation may be differences in gearing levels. It is possible to adjust for the effects of gearing on the equity beta by deriving an asset beta. An asset beta seeks to provide a measure of the underlying risk of a company. These are also set out in table 6.3, although it is for consideration whether the method for translating equity betas into asset betas is appropriate. Nevertheless, there remains a wide range of estimates across the different companies.

TABLE 6.3: EQUITY AND ASSET BETAS FOR COMPARATOR COMPANIES

Company	Gearing (debt/debt+equity) %	Equity Beta	Asset Beta
Southern	4	0.76	0.73
Hydro-Electric	14	1.00	0.86
ScottishPower	18	0.91	0.74
National Grid Group	23	0.60	0.46
United Utilities	29	0.72	0.51
Hyder	33	0.64	0.43
Anglian Water	31	0.66	0.45
Thames Water	23	0.67	0.52
BG plc	23	0.56	0.43
Range	4-33	0.56-1.00	0.43-0.86

Notes:

1 Gearing calculated as average net debt (derived from latest Annual Reports over the last five years) divided by the value of equity plus net debt.
2 The value of equity is based on five year averages.
3 Equity betas taken from the LBS Risk Measurement Service.
4 The asset beta is calculated using the following adjustment $\beta_A = (1-g)*\beta_E$ where β_A is the asset beta, β_E is the equity beta and g is the level of gearing.

6.33 The beta calculation is influenced by the period of time over which it is estimated, the frequency of the observations used for share price information, and what index is used as a measure of the market as a whole. It is for consideration whether the LBS estimates are the most appropriate.

6.34 In estimating the appropriate asset beta for the PESs distribution businesses, it is important to consider the risks the distribution business itself is exposed to, rather than the risks that might be associated with activities in the wider group. Distribution is a monopoly business with little scope for the development of competition in the operation of the network, the demand for electricity is also relatively stable. Supply and metering businesses are increasingly subject to competitive pressures and could be expected to be more risky than the distribution business alone. The proposal to separate out these activities from the distribution business may reduce the level of beta for a standalone distribution business in the future. Those companies in table 6.3 with the highest asset betas also tend to have the lowest gearing. It is not clear that increasing gearing to efficient levels will change the market's perception of risk to such an extent that distribution would be considered significantly more risky than the market as a whole. Therefore it, would seem appropriate to use an asset beta for the PES distribution businesses that is in the bottom quartile of the 0.43 to 0.86 range set out in table 6.3. On this basis a range of 0.45 to 0.55 for distribution asset betas appears to be reasonable, consistent with equity betas in the range 0.9 to 1.1.

6.35 Table 6.4 takes the ranges for the risk free rate and ERP, and combines these with the range for asset betas to give a range for the post-tax cost of equity of 4.7 to 7.1 per cent, assuming a level of gearing of 50 per cent, as discussed earlier.

TABLE 6.4: POST TAX COST OF EQUITY CAPITAL

Component	Low Case	High Case
Risk free rate	2%	2.5%
Equity Risk Premium	3%	4.2%
Asset Beta	0.45	0.55
Gearing	50%	50%
Equity Beta	0.9	1.1
Post-tax Cost of Equity	4.7%	7.1%

6.36 The dividend growth model (DGM) can be used as a supporting check on the results provided by CAPM. This method estimates the cost of equity finance by adding together a company's dividend yield with an estimate of its expected real dividend growth. Over the last three years the dividend yield on the FTSE 100 share indexed has averaged around 2½ to 3 per cent. Assuming real divided growth tends to move in line with the overall growth of the economy suggests a range of 2 to 3 per cent. Combining these estimates suggests a range for the overall cost of equity of between 4½ and 6 per cent. This is an average for the market as a whole and so should be compared with an estimate from CAPM calculated using an equity beta of 1. On this basis and using the estimates for the risk free rate and ERP set out in table 6.2 CAPM produces a range for the cost of equity

of 5 to 6.7 per cent. Therefore, the DGM suggests that estimates of the cost of capital derived from CAPM are reasonably generous.

(iv) Adjusting for Taxation

6.37 As well as paying dividends and interest, companies must also finance corporation tax payments. As interest payments are allowable against corporation tax, the cost of debt finance does not need to be adjusted upwards to take account of corporation tax.

6.38 The MMC report on NIE adjusted the cost of equity finance upwards by a tax wedge to take account of corporation tax payments. In doing so, it made a number of simplifying assumptions, including that the company pays corporation tax at the full rate and that all profits are distributed as dividends. On the basis of these simplifying assumptions, it was possible to take account of the partial imputation system for corporation tax in the UK by grossing up the post tax cost of equity by (1-Ty)/(1-Tc) where Ty was the rate of advance corporation tax (0.20) and Tc was the rate of mainstream corporation tax (0.33). This gave a tax adjustment factor of 1.194. Since the publication of the NIE report there have been some important changes to the corporate tax system, particularly the abolition of advance corporation tax and the reduction in the mainstream rate of corporation tax from 33 to 30 per cent. In its report on Cellnet and Vodafone the MMC considered these changes and the impact they might have on the tax wedge. The MMC concluded that calculations should be made by adjusting the post-tax cost of equity upwards to take full account of the abolition of advance corporation tax and the revised mainstream rate of corporation tax, giving a multiplier of 1/(1-0.3) or 1.429.

6.39 As part of the ongoing work on financial modelling, it will be important to consider whether the tax wedge is generating an appropriate amount of cash given the tax liabilities a distribution business or PES is likely to incur. This will be an important supporting check on the approach used by the MMC in its report on Cellnet and Vodafone.

6.40 Table 6.5 shows the calculation of a 5.0 to 7.1 per cent range for the pre-tax cost of capital using the estimates for the post tax cost of capital set out in table 6.4 and a tax wedge of 1.429, consistent with the approach set out by the MMC in its report on Cellnet and Vodafone.

TABLE 6.5: WEIGHTED AVERAGE PRE-TAX COST OF CAPITAL

Component	Low Case	High Case
Cost of debt	3.3%	4.1%
Post-tax cost of equity	4.7%	7.1%
Taxation adjustment	1.429	1.429
Pre-tax cost of equity	6.7%	10.2%
Gearing	50%	50%
Pre-tax WACC	5.0%	7.1%

6.41 It will be necessary to further consider matters relating to the calculation of the cost of capital as the price control review progresses and assess any additional information that emerges. In coming to a final judgement on the cost of capital, it will be appropriate to ensure that the estimate used is consistent with an efficiently financed distribution business.

Valuation of Assets

6.42 In order to secure continuing access to funds on acceptable terms, an enterprise needs to provide a return on the capital invested in its business. In the last distribution price control review the capital invested in each PES's distribution business was considered in two parts, the initial capital at flotation and investment made since then.

Assets Acquired at Flotation

6.43 In the last distribution price control review, the capital at flotation of the RECs was valued on the basis of their market value at privatisation. Certain adjustments were necessary in order to translate the value of each company as a whole into a value for each distribution business. The value of the parts of each company other than the distribution business, that is its other businesses and shareholdings in NGC, was deducted. OFFER also took account of other considerations, particularly investors' original expectations of dividend growth, their perceptions of risk and the fact that other regulators and the MMC had tended to apply some uprating to flotation asset values. In the light of these factors, OFFER's July 1995 proposals were based on the adjusted flotation values uprated by 15 per cent. The July 1998 consultation paper set out the calculation of the flotation values and the adjustments, with two different methods of valuing the shareholdings in NGC, so giving a range for the value of each REC's distribution business assets in 1990/91.

6.44 Further information has emerged since 1990 on the value of the PESs as a whole and on the individual components of their businesses. For instance, there is now direct evidence on the market value of transmission and supply businesses. However, this does not undermine the original approach to

distribution asset valuation, as this was based on market values at privatisation, rather than developments since then.

6.45 The MMC's 1997 report on NIE confirmed that other regulators and the MMC had tended to apply an uprate to flotation values. It concluded that "an uplift on the close of first-day trading has been adopted in nearly all previous cases where price reviews have been carried out, ranging from 26 per cent in the case of British Gas to single figures for the water and sewerage companies….. Taking account of the various considerations which we set out above, we have adopted an uplift of seven and a half per cent for the purposes of this review" (paragraphs 2.83 and 2.84).

6.46 Somewhat different considerations have applied to the Scottish companies. In its May 1995 report on Hydro-Electric the MMC translated the flotation value for the company as a whole into a value for the distribution and transmission businesses by subtracting a value for the generation business of Hydro-Electric. These generation assets were valued on the basis of the same relationship to their current cost book value as was implicit in the market valuation of the assets of National Power and PowerGen. The value for the distribution business that emerged from this was close to the value used by the Scottish Office in setting Hydro-Electric's original distribution price control, and it was this original price control value that the MMC used as a basis for its 1995 price control proposals.

6.47 In response to the July 1998 consultation paper most of the PESs said that there should be no change to the approach for valuing the flotation assets, suggesting that to revisit this issue would increase investors' perceptions of uncertainty and so increase the cost of capital. A number of other respondents to the July 1998 consultation paper also made similar comments.

6.48 These arguments appear to have some force. Any significant increase in the cost of capital would tend to increase prices to customers by more than the reductions that would be associated with measures such as removing the 15 per cent uprate on the RECs' flotation assets. In its May 1997 report on British Gas, the MMC explained that the approach adopted to asset valuation in its 1993 MMC report remained appropriate, suggesting that the MMC believes that there are advantages in consistency.

6.49 Bearing these considerations in mind it would appear reasonable to adopt an approach to valuing flotation assets consistent with that used in the last distribution price control review. Table 6.6 shows asset values for each REC's distribution business on this basis, calculated by taking the average of the values set out in the July 1998 consultation paper, updated to 1997/98 prices.

TABLE 6.6: 1990/91 ASSET VALUES FOR THE REC DISTRIBUTION BUSINESSES (1997/98 PRICES £MILLION)

REC	£M
Eastern	1028
East Midlands	786
London	657
Manweb	474
Midlands	705
Northern	392
NORWEB	681
SEEBOARD	429
Southern	922
SWALEC	289
South Western	464
Yorkshire	725
Total	7551

6.50 Paragraph 6.46 describes the MMC's approach to valuing Hydro-Electric's distribution business, which gave a 1990/91 value of £464 million, or £572 million in 1997/98 prices. It is for consideration whether a similar approach should be adopted to valuing the distribution business of ScottishPower.

Investment Made Since Flotation

6.51 The present price control was set to finance network capital expenditure over the period 1990/91 to 1994/95 and the projected spending for the period 1995/96 to 1999/2000. The July 1998 consultation paper proposed that in the present price control review only the actual network capital expenditure for the period 1995/96 to 1999/00 would be financed rather than the projected level of spending, provided that the actual expenditure represented a prudent level of spending.

6.52 The July 1998 consultation paper also explained that it would be necessary to give consideration to the reasons for any short fall in actual capital expenditure compared to the projections on which the present price control was based, taking into account quality of supply. These matters are discussed further in chapters 4 and 5. If this analysis suggests that it is necessary to make an adjustment for past underspend it will be necessary to take into account the approach adopted by the MMC in its 1997 report on NIE. The MMC stated that "in the circumstances of this particular price determination, that it is appropriate to make an adjustment to the future level of provision for capital expenditure because of the level and nature of

the past underspend. On the one hand, it is clear that substantial expenditure, particularly on the transmission system, which has been postponed from the first price control period will need to be undertaken in the second. We do not consider it appropriate that all such expenditure should be refinanced under the new price control. On the other hand we think that NIE should carry out a programme of capital expenditure at the level proposed in the next section. It would not, therefore, be satisfactory simply to reduce the level of that programme. Our decisions to some extent reflects the absence of output measures for the period concerned which would have permitted a considered judgement to be made of the justification for the underspend. Bearing in mind the incentives aspect, and in view of the fact that the present situation is less than ideal because of the absence of established output measures, we consider that the adjustment should be based on one-third of the value of the total underspend in the three middle years of the first period, a level of £25 million. We believe that an adjustment at this level would not significantly reduce the incentive on NIE to look for ways of reducing expenditure in future, nor do we consider that it would affect NIE's ability to finance the carrying on of its licensed activities…." (p30, para 2.117-2.118).

Asset Lives

6.53 A related issue to the valuation of assets is the period of time over which assets are written off or depreciated. In setting the last distribution price control, OFFER assumed that the flotation values associated with each REC's distribution business would be written off on a uniform annual basis, typically over 10 to 15 years, depending on the average age of each REC's assets at Vesting, as set out in table 6.7 below. In its report on NIE, the MMC took a more disaggregated approach, attributing the flotation value to various categories of assets and writing off each part of the total according to the accounting life of each category of asset. If applied to the RECs, the effect of this policy would be to write off the flotation values over a longer period, which in turn would reduce allowed revenue in the period 2000 to 2005 and to increase it beyond 2005. OFFER also assumed that investment made since flotation would be written off on a uniform annual basis, over a period of 33 years, reflecting the RECs' accounting treatment of these assets, which involved depreciation at 3 per cent per year.

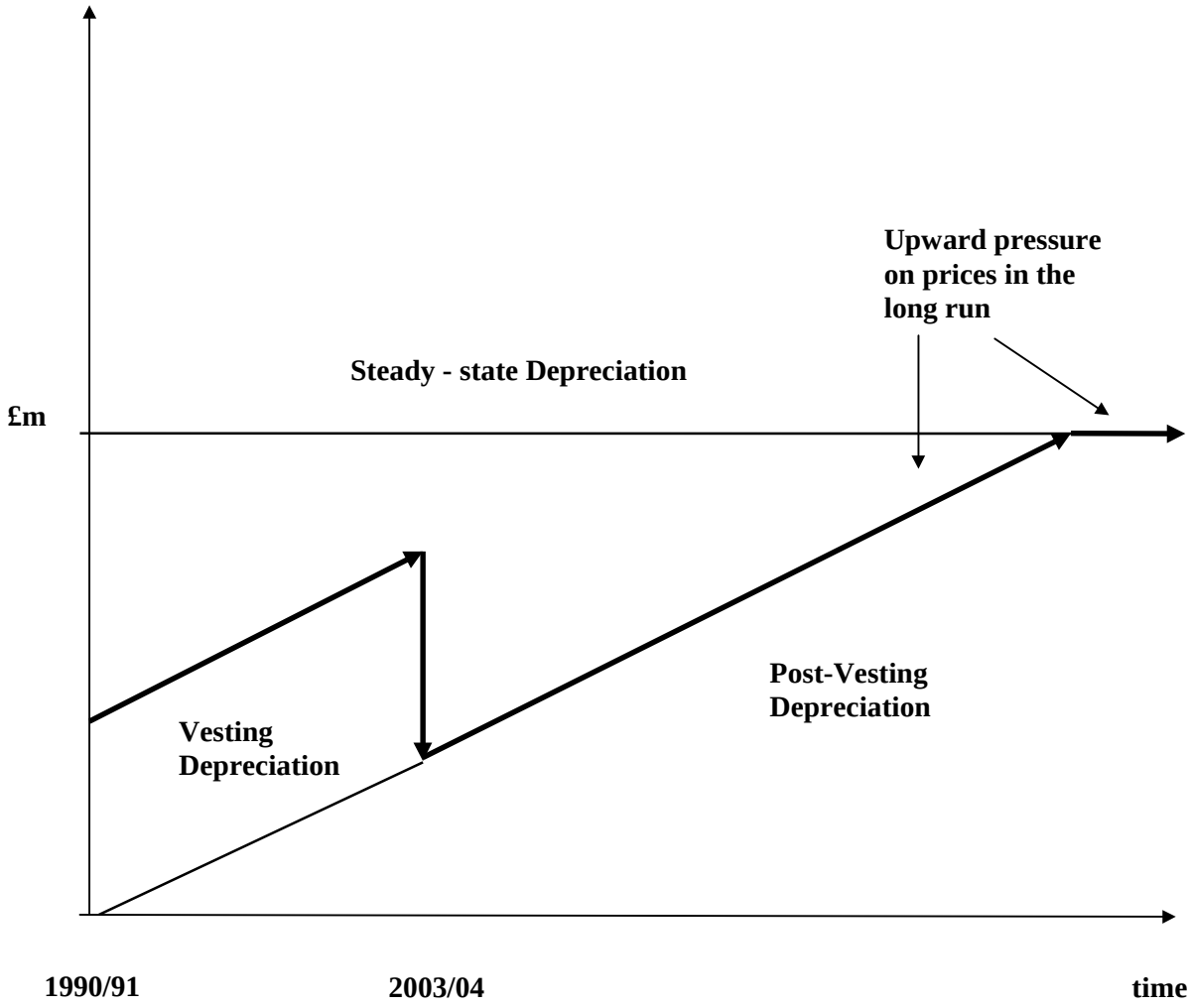
TABLE 6.7: VESTING LIVES

REC	Life in Years
Eastern	14
East Midlands	15
London	15
Manweb	15
Midlands	15
Northern	14
NORWEB	11
SEEBOARD	13
Southern	15
SWALEC	11
South Western	15
Yorkshire	15

6.54 Different considerations applied in the case of the Scottish companies. In its report on Hydro-Electric the MMC assumed a 20 year life for Vesting assets and a 38 year life for post-Vesting assets.

6.55 In deciding on the approach to asset lives for the period after 2000/01, it is important to bear in mind the impact of any assumptions on the financial position of the distribution business and on the path of prices to customers over the period of the proposed price control and beyond. Figure 1 shows a stylised representation of the allowance for depreciation in the calculation of price control allowed revenue over the period 1997/98 to 2027/28 assuming the same assumptions with respect to depreciation as used in the last price control review for the RECs. The graph shows a sharp fall in depreciation in the period after 2000 followed by increasing allowances in the longer term.

FIGURE 6.1: DEPRECIATION PROFILES USING CURRENT ASSUMPTIONS ON ASSET LIVES



6.56 The fall in depreciation after the year 2000 is caused by the writing down of Vesting assets on a straightline basis, over an average of about 14 years. The associated depreciation allowances would be exhausted by about 2005, causing a sharp fall in the total depreciation allowances (those on Vesting assets plus post-Vesting capital expenditure). Nevertheless, the depreciation on post-Vesting assets gradually increases, until depreciation and capital expenditure allowances are in steady-state, probably some time after the year 2020, by which time the allowances for depreciation in the calculation of price control revenue and the size of the asset base may be significantly higher than at present, putting upward pressure on prices to customers.

6.57 The extent to which these issues cause difficulties in the future will depend on a number of factors, including future trends in operating costs and capital expenditure. In terms of regulatory stability, there may be advantages in consistency with the assumptions made at the last review, and any change will only be considered if there are advantages for customers, such as

reducing the distribution businesses' cost of capital or bringing about a smoother path of prices in the future. As the price control review progresses, it will be possible to make a more accurate assessment of these factors and the extent to which each distribution business may be constrained by its overall financial position. Nevertheless, in order to promote a timely debate on relevant issues, a number of possible solutions to the potential difficulties identified above can be considered. These include the following, which would be neutral in present value terms but alter the relative path of prices in the future:

- adopting the same approach to Vesting depreciation as set out by the MMC in its report on NIE;
- funding a greater proportion of capital expenditure within each price control period, rather than adding it to the asset base and depreciating it over a number of years; and
- tilting the depreciation on post-Vesting assets so more is recovered in the period 2000-2010 and less thereafter.

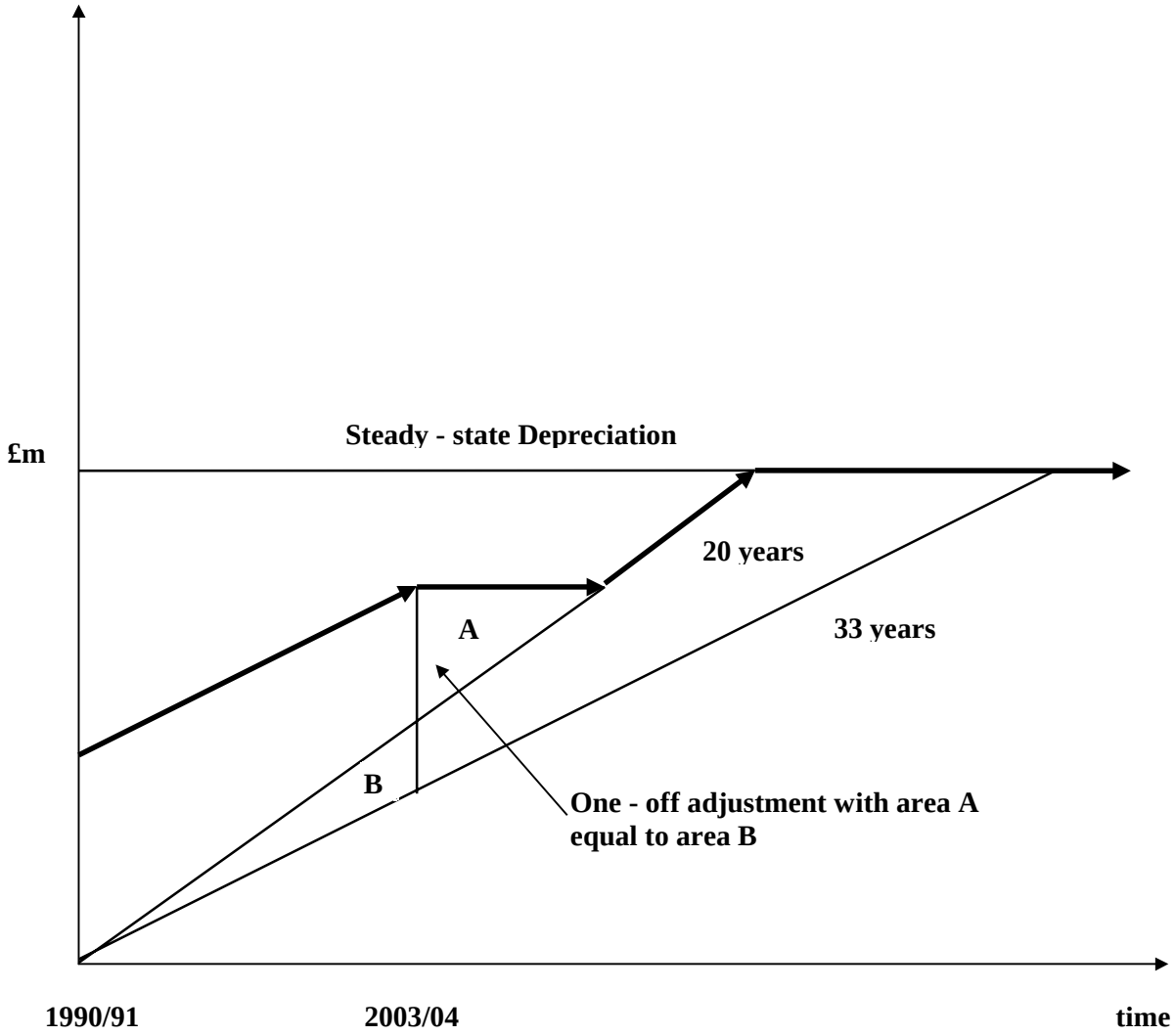
6.58 As explained in paragraph 6.53, the approach set out by the MMC in its report on NIE to Vesting assets would tend to reduce depreciation allowances in the period 2000-2005 and increase them, thereafter. This would tend to exacerbate the problems associated with the existing depreciation profiles and therefore does not appear to be a viable option for the RECs.

6.59 In the calculations associated with the last price control review, non-operational capital expenditure was treated in a similar way to operating costs, with the allowance for non-operational capital expenditure funded entirely within the period of the price control. It would be possible to extend this principle to a greater proportion of capital expenditure, perhaps encompassing non-load related network expenditure. Although this would increase prices to customers in the medium term, it would increase distribution business cash flow in the period 2000-2010 and also reduce the steady-state level of the asset base, putting downward pressure on prices to customers in the longer term. It would also reduce the asymmetry of treatment between capital and operating costs in the calculation of allowed revenue. However, this would very significantly increase incentives on PESs to underspend on capital expenditure programmes. It is not clear that this is appropriate, particularly in the light of the need to enhance arrangements for monitoring capital expenditure and quality of supply identified in chapter 2.

6.60 Another option would involve tilting the depreciation on post-Vesting assets. This could be achieved by moving to a 20 or 25 year asset life as the depreciation allowances associated with Vesting assets came to an end. A one-off adjustment would be needed to price control revenue to ensure that in present value terms PESs would be neutral to this change. Spreading this over five to ten years after the end of the Vesting depreciation allowances would further smooth the profile of depreciation in the

calculations of price control revenue. Although this would increase prices to customers in the medium term, it would improve distribution business cash flow between 2000-2010, reduce the steady-state level of the asset base and so put downward pressure on prices to customers in the longer term. It would also reduce the asymmetry of treatment between operating and capital costs in the calculation of price control revenue, while keeping the automatic correction for capital expenditure underspend created by adding new capital expenditure to the asset base. Figure 2 shows a stylised representation of the allowances for depreciation on the basis of a change to a 20 year life for post-Vesting assets with an appropriate adjustment to ensure that in present value terms the impact of the change is neutral.

FIGURE 6.2: DEPRECIATION PROFILES WITH ASSET LIVES TILTED TO 20 YEARS



Asset Values in 1994/95 and 1999/00

6.61 As discussed in chapters 3 and 4, a number of PESs have made changes to their accounting policies since the last price control review. Some PESs are capitalising expenditures that were previously treated as operating costs while others have classified expenditure previously designated non-operational expenditure as network capital expenditure. It is not appropriate for a PES to gain at a price control review because of a change in accounting policy. Therefore, capital expenditure will be adjusted for changes in capitalisation policy made between 1994/95 and 1999/00. The PESs have been asked to quantify the effects of these changes and OFFER's consultants are analysing these estimates.

6.62 Nevertheless, it appears capital expenditure made between 1990/91 and 1994/95 was classified and accounted for on a reasonably consistent basis and it is possible to update the asset values set out in table 6.6 for network expenditure over this period.

6.63 Table 6.8 shows asset values in 1990/91, subsequent depreciation and investment and asset values at the end of 1994/95. More detailed calculations are set out in Annex 5.

TABLE 6.8: DISTRIBUTION BUSINESS ASSET VALUES IN 1990/91 AND 1994/95 (1997/98 PRICES £M)

PES	Asset Values in 1990/91	Depreciation Allowances	Capital Expenditure	Asset Values in 1994/95
Eastern	1028	(327)	224	924
East Midlands	786	(244)	351	892
London	657	(201)	274	730
Manweb	474	(146)	239	567
Midlands	705	(216)	312	801
Northern	392	(130)	209	471
NORWEB	681	(276)	246	651
SEEBOARD	429	(153)	224	500
Southern	922	(285)	481	1118
SWALEC	289	(123)	242	407
South Western	464	(145)	240	559
Yorkshire	725	(217)	210	718
Total	7551	(2465)	3252	8338

Investment Over the Period of the Next Price Control

6.64 The expectation that at a price control review asset values will be rolled forward to the start of the review period using actual capital expenditure, rather than the projections of capital expenditure on which the existing control was based, will tend to reduce incentives on PESs to operate efficiently. This will take two forms: a general reduction in the incentives on PESs to make efficiencies in capital expenditure; and an incentive to defer spending to the end of the price control period. Chapter 4 sets out some of the evidence showing that PESs have tended to defer capital expenditure from the start to the end of price control periods.

6.65 These perverse incentives would be reduced by making a commitment in this price control review to adjusting asset values in the next price control review by actual rather than projected spending on a rolling basis after the lapse of a fixed number of years. The appropriate length of the lag is for consideration. Any commitment of this sort would need to be conditional on PESs meeting their obligations with respect to the security and quality of supply.

6.66 Adjusting asset values on a rolling basis is similar to the approach proposed by OFWAT in its 1998 paper on the framework for setting prices in the water industry.

Financial Modelling

6.67 In the light of the DGES's duty to secure that licence holders are able to finance the carrying on of the activities which they are authorised by their licences to carry on, it will be important to consider what sort of supporting checks would be appropriate on the financial position and viability of the licence holder.

6.68 The distribution price control applies only to certain distribution business activities. This might suggest confining any supporting checks on financial viability to the distribution business. On the other hand the licence holder is the PES, and where PESs have been taken over and have become parts of larger groups, licence conditions have been put in place that limit the scope of the other activities carried out by the PES itself and create a financial ring fence round the PES to protect it from financial difficulties that might arise in the wider group. As explained in chapter 1, these circumstances suggest it is appropriate to focus checks for financial viability on the PES, rather than the wider group.

6.69 The interests of customers are best protected by strengthening incentives on companies to increase efficiency and reduce costs. To translate this into price control proposals, it is necessary to assess how much revenue would be required for each company in three main areas; operating costs, capital expenditure and financing costs. OFFER has engaged consultants to assist in this analysis, which will involve a variety of methods and techniques

designed to assess factors such as relative efficiency, best operating practice and the appropriate trade off between operating and capital expenditure. The results of this work should allow the future price controls to be based around the efficient level of costs, which may be lower than existing levels or the companies' future forecasts of their own costs. OFFER's projections of the efficient level of costs will be used in the financial modelling to help inform judgements about financial viability.

6.70 In assessing financial viability, it is important to consider what sort of tests are most appropriate. In its 1997 report on PacifiCorp and the Energy Group, the MMC indicated that "it would be essential for Eastern Electricity to have access to requisite finance on acceptable terms. This can be ensured by the maintenance of an investment grade credit rating for the debt of the company" (paragraph 2.72). This is consistent with the approach adopted by OFFER in establishing the financial ring fencing provisions and in the approach to the cost of capital discussed earlier in this chapter. In the light of this, it appears reasonable to focus checks for financial viability on the ability of the PES to maintain an investment grade credit rating for its debt.

6.71 Both Moody's and Standard & Poor's stress the importance in determining credit ratings of qualitative factors such as overall management strategy and perceptions of the regulatory environment, as well as quantitative assessments based on financial modelling. Nevertheless, both agencies have published guidance on the financial analysis they undertake, both generally and specifically in respect of electric utilities. The overall approach is to examine earnings, cash flow and capital structure in relation to debt service obligations, working capital needs and capital expenditure requirements. This analysis is carried out using both historical results and future projections. Particular emphasis is placed on analysis of real stocks and flows (levels of debt, cash and cash flow), in view of the difficulty of comparing reported earnings and balance sheet data between companies operating under different regulatory regimes and following different accounting conventions. Therefore, parameters such as the coverage of fixed financial charges by cash flow and the ratio of free cash flow to total debt are considered more relevant and reliable than earnings coverage or balance sheet gearing.

6.72 Measures of financial protection, as revealed by such analysis, are considered in the context of the utility's business profile. A company with a strong business profile may have less financial protection than a company with a weaker business profile yet achieve a similar credit rating (and vice versa). Transmission and distribution activities face limited business risk, and are thus able to sustain lower interest coverage and higher gearing, compared for example to generation which operates in a more competitive environment with greater cash flow volatility. In its September 1998 publication on infrastructure finance, Standard & Poor's published the following median financial ratios for power utilities, derived from the agency's own financial analysis.

TABLE 6.9: STANDARD & POOR'S FINANCIAL RATIO MEDIANS

SECTOR	Funds from Operations Interest coverage (x)		Funds from operations to total debt (%)		Total debt to total capital (%)	
	A	BBB	A	BBB	A	BBB
Transmission and Distribution	3.25	2.00	15	10	55	65
Generators	6.75	4.25	42	27	35	45
Vertically integrated	4.25	2.75	27	18	45	56

6.73 Comparable statistics for lower rated companies are not available, so that it is not practicable to assess where, in terms of values for these key financial ratios, the borderline between investment and speculative grade debt should be drawn. Clearly, the averages given above are comfortably within the envelope required for investment grade debt. In assessing the potential reaction of credit rating agencies to changes in the PESs' financial positions over the period of the revised price control, OFFER will have particular regard to the above ratios. Where the averages for these ratios over the period of the revised price control indicate a financial position broadly consistent with that implied by the median BBB figures for transmission and distribution companies in Table 6.9**,** and in the absence of evidence that severe deterioration will occur after the end of the period, it would be reasonable to assume that the revised control will not threaten PES's ability to sustain an investment grade credit rating for its debt.

6.74 Debt instruments, especially bank loan agreements, frequently contain conditions obliging the borrower at all times to maintain certain financial ratios within specified limits. A borrower unable to comply may find access to credit restricted, or be obliged to pay higher interest. In the extreme case, such a borrower may be required to repay outstanding borrowings before their due date. The most widely used ratio for these purposes is that of earnings before interest, taxation, depreciation and amortisation (EBITDA) over interest expense. This ratio is sometimes referred to as EBITDA interest coverage. It appears that, in current credit market conditions, sustained EBITDA interest coverage significantly below 2.0 may restrict access to medium and long-term sources of credit. It will therefore be appropriate also to have regard to this ratio.

Other Matters

6.75 Schedule 7 of Hydro-Electric's licence allows for a cross-subsidy known as Hydro Benefit from its generation business to its transmission and distribution businesses. The transfer provides for the relatively low operating costs of the hydro resources of the generation business to be used to offset potentially higher charges to customers in the transmission and distribution businesses, where such higher charges might result from climatic and geographic characteristics of Hydro-Electric's area. At present the maximum allowed by the licence condition is £40 million a year in 1990/91 prices uprated annually by inflation. In its report on Hydro-Electric in 1995, the MMC applied £20.2 million (in 1994/95 prices) of Hydro Benefit to the distribution business to make Hydro-Electric's distribution charges comparable to ScottishPower's. The present review will assess the scope for Hydro Benefit and the extent to which it should be applied to its distribution business.

Issues for Consideration

6.76 Views are invited on any aspect of the financial issues associated with the distribution price control review, and in particular on:

- whether the approach to gearing and efficient capital structures is appropriate;
- the cost of debt and equity finance, including the adjustment for corporation tax;
- whether the approach to valuing privatisation assets is appropriate;
- the most suitable approach to calculating depreciation profiles after 2000, in particular whether there should be a smoother path of depreciation and prices over time;
- whether asset values should be updated for actual capital expenditure on a rolling basis; and
- what sort of supporting checks should be made on the financial position of the PES, in particular whether the approach to maintaining the investment grade status of PES debt is appropriate, and whether the financial ratios identified in paragraph 6.73 are suitable.

ANNEX 1: REGIONAL ADJUSTMENTS TO OPERATING COSTS – LABOUR COSTS

To assess the appropriate staff costs in each PES area, the different grades of staff within each PES were examined. The table below shows the grade types that were used and the percentage of each staff in each grade. The table also shows the corresponding Group classifications in the 1997 New Earnings Survey, from which average weekly earnings for each grade were obtained.

TABLE 1A.: ANALYSIS OF PES MANPOWER FIGURES FOR 1997/98

	Grade	Grade	Grade	Grade	Grade
Offer description	unskilled	semi-skilled	industrial	professional	senior professional
New Earnings Survey Group	All manuals	Group 4	Group 5b	Group 2a	Group 1a
Weekly earnings GB median	£314.3	£282.6	£389.3	£528.2	£629.4
% of staff in Group	4%	26%	44%	19%	7%

Note: Weekly earnings figures are as at April 1997

Multiplying the weekly earnings of each grade by the percentage of staff in that grade gives average earnings per employee of £401 per week. In addition to this cost, the PES payroll costs include the additional costs of employment associated with National Insurance payments, pension costs and overtime/bonuses.

Based on the above grading of staff, the average weekly earnings in the London area is £464 per week. Therefore London's payroll costs might be expected to be 16% above the GB average. OFFER's December consultation paper showed London's payroll costs in 1997/8 to be £57.0 m. On a GB basis these costs might have been expected to be £49m (£57m / 1.16), implying a labour cost adjustment of £8m.

London has located its main call centre near Sunderland, and the impact of this on London's labour costs will need to be investigated. Also, London have indicated that their payroll costs include some costs associated with NTRs, which are excluded from distribution operating costs. Both of these factors may tend to reduce the level of any eventual labour cost adjustment.

ANNEX 2: DISTRIBUTION BUSINESS COST DRIVERS

Specification of the composite size variable

The first stage in the modelling process to establish an explanatory variable which represents each distribution businesses cost drivers. The following model constructs a composite size variable using a weighted average of customer numbers, units distributed and network length.

A functional form similar to the Cobb-Douglas production function has been used, as follows

$$\text{Cost £m pa} = A + (B * \text{cust nos.}^{\alpha} * \text{units}^{\beta} * \text{length}^{\gamma})$$

where $\alpha + \beta + \gamma = 1$, with $\alpha > 0.5$

and α, β and γ are, as elsewhere in this Annex are the powers of the different explanatory factors

The relationship then becomes

$$\text{Cost £m pa} = A + (B * \text{cust nos.} * (\text{units/cust nos})^{\beta} * (\text{length/cust nos})^{\gamma})$$

Additional explanatory factors could if desired be included in the model in a similar way to units and length. The values of β and γ are both set to 0.15.

The effect of the additional explanatory variables is to adjust the customer numbers for each PES to account for the differences in units delivered per customer and length of line per customer. The relationship can therefore be expressed as

$$\text{Cost £m pa} = A + (B * \text{adjusted cust nos.})$$

Calculation of the adjusted customer numbers

The simple regression equation

$$\text{Cost £m pa} = A + (B * \text{cust nos.})$$

where A and B are constants, assumes that in respect of all factors other than customer numbers the data points being modelled have similar characteristics. Therefore, for example, the units consumed per customer and the length of network per customer would be the similar for each data point.

The formulation of the following model recognises that there is variation in these factors between PESs (model (1)):

$$\text{Cost £m pa} = A + (B * \text{cust nos.} * (\text{units/cust nos.})^{\beta} * (\text{length/cust nos.})^{\gamma})$$

What this model does is to provide an adjustment for the extent to which each PES differs from the average value of units per customer and length of network per customer for the population as a whole. This is shown be reworking the model equation as follows:

Let U be the average value for units per customer over all PESs and L be the average value for length of network per customer over all PESs (model (2)):

$$\text{Cost £m pa} = A + (B * \text{cust. nos.} (U + \delta U)^{\beta} * (L + \delta L)^{\gamma})$$

where δU and δL are the deviations in the data point values from the population averages.

Then with $\beta<1$ and $\gamma<1$ and ignoring second order terms, the model (2) can be rewritten, with a new constant D, as

$$\text{Cost £m pa} = A + (D * \text{cust. nos.} (1+ \beta\, \delta U/U) * (1 + \gamma\, \delta L/L)).$$

Further simplifying, and again ignoring second order terms, this is

$$\text{Cost £m pa} = A + (D * \text{cust. nos.} (1+ \beta\, \delta U/U + \gamma\, \delta L/L))$$

Then, writing

$$\text{Adjusted customer numbers} = \text{cust. nos.} (1+ \beta\, \delta U/U + \gamma\, \delta L/L)$$

the model becomes:

$$\text{Cost £m pa} = A + (B * \text{adjusted cust nos.})$$

where A and B are constants.

Table 2A.1 shows the calculation of the adjustment for units delivered and table 2A.2. the adjustment for length of network.

The adjusted customer number figures are presented in table 2A.3.

The differences between actual and adjusted customer numbers is most significant for 3 PESs, London, SEEBOARD, and Hydro-Electric.

TABLE 2A.1: PES NETWORK DATA FOR 1997/98

PES	Customer nos. 000s 1997/8	Regulated units delivered GWh	units per customer	units deviation d*U*	d*U/U*	b * d*U/U*
Eastern	3156	30432	9.6	-0.4	-0.039	-0.006
East Midlands	2310	25430	11.0	1.0	0.097	0.015
London	2001	21279	10.6	0.6	0.060	0.009
Manweb	1387	13458	9.7	-0.3	-0.033	-0.005
Midlands	2256	24649	10.9	0.9	0.089	0.013
Northern	1472	13106	8.9	-1.1	-0.113	-0.017
NORWEB	2211	22545	10.2	0.2	0.017	0.002
SEEBOARD	2108	17435	8.3	-1.8	-0.176	-0.026
Southern	2650	26527	10.0	0.0	-0.002	0.000
SWALEC	977	8722	8.9	-1.1	-0.110	-0.017
South Western	1332	13041	9.8	-0.2	-0.024	-0.004
Yorkshire	2079	21163	10.2	0.1	0.015	0.002
Hydro-Electric	636	7492	11.8	1.7	0.174	0.026
Scottish Power	1853	19453	10.5	0.5	0.046	0.007
Average *U*			10.0			

Notes

1. Regulated units delivered has been rather than total units delivered since EHV units delivered can vary considerably from year to year and also the specific network costs associated with EHV units are generally covered by the EHV connection charges.

2. It is assumed that the number of EHV customers does not affect the units per customer 000s figures.

3. The value of b = 0.15

TABLE 2A.2: PES NETWORK DATA FOR 1997/98

PES	Customer nos. 000s 1997/8	Length of network km	length per customer	length deviation d*L*	d*L/L*	g * d*L/L*
Eastern	3156	89304	28.3	-3.0	-0.096	-0.014
East Midlands	2310	65846	28.5	-2.8	-0.090	-0.013
London	2001	29798	14.9	-16.4	-0.524	-0.079
Manweb	1387	45434	32.8	1.4	0.046	0.007
Midlands	2256	59498	26.4	-4.9	-0.158	-0.024
Northern	1472	41893	28.5	-2.9	-0.091	-0.014
NORWEB	2211	58010	26.2	-5.1	-0.162	-0.024
SEEBOARD	2108	44745	21.2	-10.1	-0.322	-0.048
Southern	2650	71807	27.1	-4.2	-0.135	-0.020
SWALEC	977	32529	33.3	2.0	0.064	0.010
South Western	1332	52298	39.3	8.0	0.254	0.038
Yorkshire	2079	54753	26.3	-5.0	-0.159	-0.024
Hydro-Electric	636	45252	71.1	39.8	1.272	0.191
Scottish Power	1853	63835	34.5	3.1	0.100	0.015
Average *L*			31.3			

Notes
1. The value of g = 0.15

TABLE 2A.3: PES ADJUSTED CUSTOMER NUMBERS FOR 1997/98

PES	Customer nos. 000s	Adjustment factor		1 + b * d*U/U* + g * d*L/L*	Adjusted customer numbers 000s
	1997/8	b * d*U/U*	g * d*L/L*		
Eastern	3156	-0.006	-0.014	0.980	3092
East Midlands	2310	0.015	-0.013	1.001	2313
London	2001	0.009	-0.079	0.930	1862
Manweb	1387	-0.005	0.007	1.002	1390
Midlands	2256	0.013	-0.024	0.990	2233
Northern	1472	-0.017	-0.014	0.969	1427
NORWEB	2211	0.002	-0.024	0.978	2162
SEEBOARD	2108	-0.026	-0.048	0.925	1951
Southern	2650	0.000	-0.020	0.979	2596
SWALEC	977	-0.017	0.010	0.993	970
South Western	1332	-0.004	0.038	1.034	1378
Yorkshire	2079	0.002	-0.024	0.978	2034
Hydro-Electric	636	0.026	0.191	1.217	774
Scottish Power	1853	0.007	0.015	1.022	1894

ANNEX 3: CAPITAL EXPENDITURE AND CAPITALISATION POLICY

TABLE A3:1: CAPITAL EXPENDITURE AND CAPITALISATION POLICY

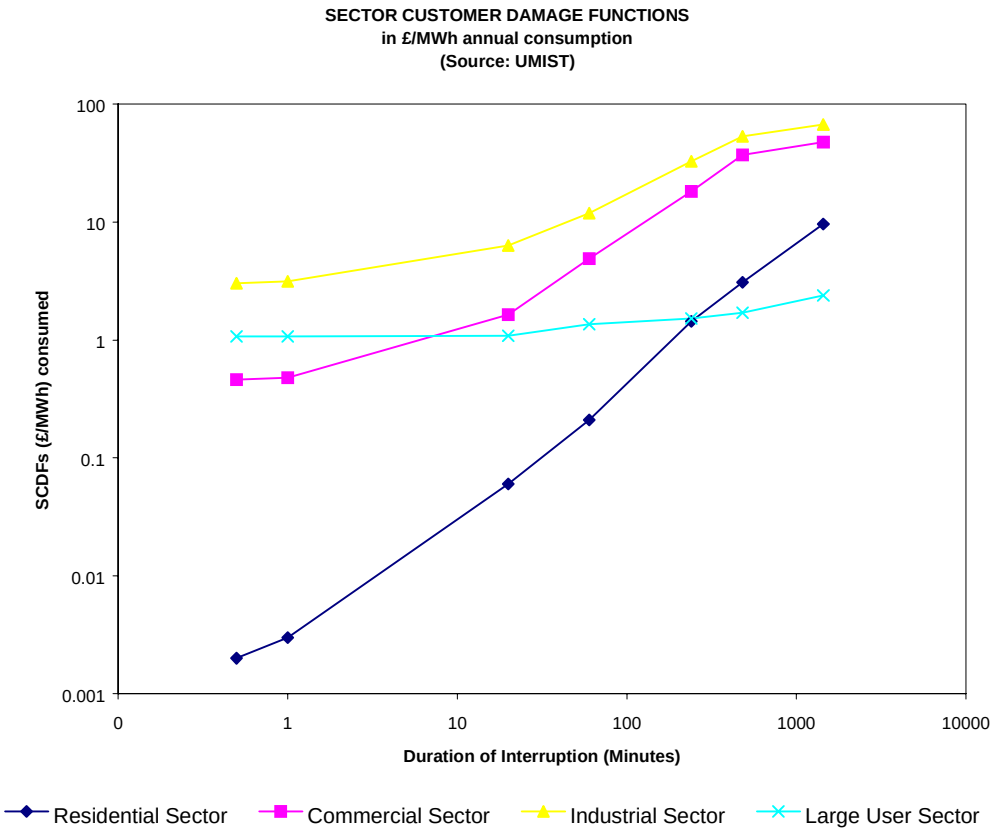
	Companies' 98 updated forecast	Adjustments		Adjusted forecasts
		Non operational IT	Capitalisation	
Eastern	737.3	0.0	0.0	737.3
East Midlands	488.5	0.0	0.0	488.5
London	510.6	0.0	0.0	510.6
Manweb	353.4	-17.3	-1.6	334.5
Midlands	476.6	0.0	0.0	476.6
Northern	300.2	0.0	0.0	300.2
NORWEB	503.7	-17.6	-10.9	475.2
SEEBOARD	363.7	-65.8	-33.1	264.8
Southern	736.3	0.0	-47.0	689.3
SWALEC	349.3	0.0	0.0	349.3
South Western	369.5	-10.3	0.0	359.2
Yorkshire	562.5	0.0	-46.5	516.0
Hydro-Electric	304.6	0.0	0.0	304.6
ScottishPower	426.3	-18.1	-3.5	404.7
Total	**6482.4**	**-129.1**	**-142.6**	**6210.7**

	Companies' 2000 forecast	Adjustments		Adjusted forecasts
		Non operational IT	Capitalisation	
Eastern	1049.1	0.0	0.0	1049.1
East Midlands	698.0	0.0	0.0	698.0
London	532.5	0.0	0.0	532.5
Manweb	431.6	-23.0	-2.0	406.6
Midlands	485.4	0.0	0.0	485.4
Northern	356.2	0.0	0.0	356.2
NORWEB	871.3	0.0	-18.2	853.1
SEEBOARD	389.9	-27.4	-44.6	317.9
Southern	745.7	0.0	-47.0	698.7
SWALEC	319.0	0.0	0.0	319.0
South Western	349.9	-2.1	0.0	347.8
Yorkshire	538.9	0.0	-77.5	461.4
Hydro-Electric	297.6	0.0	0.0	297.6
ScottishPower	490.5	-18.5	-3.5	468.5
Total	**7555.6**	**-71**	**-192.8**	**7291.8**

ANNEX 4: SYSTEM CUSTOMER OUTAGE COSTS

In order to evaluate schemes to improve quality of supply, it is helpful to be able to compare the value of such improvements against the corresponding costs of the schemes. There are a number of approaches to this, including a method based on System Customer Outage Costs (SCOCs).

SCOCs are based on the costs that customers might incur during an interruption in supply. The SCOC is evaluated from Sector Customer Damage Functions (SCDFs), the number of interruptions, interruption durations and system customer mix. SCDFs are determined from customer surveys and represent the financial impact on customers from interruptions as a function of interruption duration. The figure below shows SCDFs as a function of outage duration.



The values shown are taken from the published literature. Comments are invited on their appropriateness.

For each customer sector the SCOC for a particular year is calculated as the sum of:

> (Frequency of interruptions) x (annual energy consumed) x (percentage of interruptions of a given duration x SCDF for that particular sector and interruption duration)

The overall SCOC for a particular year is the sum of the sector SCOCs.

For example, in the case of Eastern, the SCOC for the residential sector for the year 1994/95 has been calculated as £6.5 million from:

Frequency of interruptions per year		**Energy consumed by residential sector (TWh)**		**Weighted Customer Interruption Cost (£/MWh of annual consumption)**
0.824	x	12.571	x	0.6296

where the weighted Customer Interrupted Cost has been calculated as follows:

Interruption duration	**% customers whose supplies are interrupted for the stated duration***	**SCDF (£/MWh)**	**% customers x SCDF**
1 to 20 mins	15.0%	0.04	0.006
20 mins to 1 hour	20.9%	0.18	0.0376
1 to 2 hours	27.6%	0.38	0.105
2 to 3 hours	17.5%	0.8	0.14
3 to 4 hours	8.6%	1.2	0.103
4 to 8 hours	9.4%	2.0	0.188
8 to 12 hours	0.6%	4.0	0.024
12 to 18 hours	0.3%	6.0	0.018
18 to 24 hours	0.1%	8.0	0.008
Total	100.0%		0.6296

*as declared by company but adjusted to give an average outage duration consistent with Security and Availability indices.

The corresponding residential SCOCs for each of the five years of the present price control are £6.3 million, £6.0 million, £5.4 million, £5.1 million and £4.7 million. The fall in these values reflects the forecast improvements in security and availability indices. SCDFs for other customer sectors are calculated in a similar manner.

For the evaluation of the quality of supply measures undertaken in the present price control period, the benefits are the capitalised savings in SCOC for each year from 1995/96 to 1999/2000 (calculated from data provided by the companies) and for each of the years 2000/01 to 2014/15 (the values of SCOC have been assumed to be the same as for 1999/2000). The savings in SCOC are with respect to a base SCOC calculated for each year from 1995/96 to 1999/2000 assuming load growth as outturn but no improvement in system performance. For the analysis of the quality measures proposed for the forthcoming price control period, a similar procedure has been adopted but starting five years later.

SCOCs are typically dominated by the commercial and industrial sectors. SCDFs for domestic customers (normalised on a basis of annual energy consumption) are typically about 5 per cent of those of commercial customers and only 2 per cent of those of industrial customers. In a simple study of the type performed here, there is a danger of overestimating the effect of SCOCs because of the weighting from the commercial and industrial sectors. Many of the measures being proposed to improve quality are on overhead and therefore predominantly rural systems. The majority of benefits will therefore be experienced by domestic and farm customers, and not commercial and industrial customers or large users. Accordingly, the commercial and industrial sector SCOCs have been reduced by 90 per cent and the large user SCOC has been eliminated from consideration.

ANNEX 5: DISTRIBUTION BUSINESS ASSET VALUES

TABLE 5A: DISTRIBUTION BUSINESS ASSET VALUES 1990/91 - 1994/95 IN 1997/98 PRICES

PES		1990/91 £m	1991/92 £m	1992/93 £m	1993/94 £m	1994/95 £m
Eastern	Opening	1028	1030	1019	981	949
	Depreciation	- 21	- 74	- 76	-77	-79
	Capital Expend	24	63	38	45	54
	Closing	1030	1019	981	949	924
East Midlands	Opening	786	797	832	862	898
	Depreciation	-15	-53	-56	-58	-61
	Capital Expend	27	88	86	94	56
	Closing	797	832	862	898	892
London	Opening	657	666	672	685	703
	Depreciation	-13	-44	-46	-48	-50
	Capital Expend	22	50	59	66	77
	Closing	666	672	685	703	730
Manweb	Opening	474	478	483	505	541
	Depreciation	-9	-32	-33	-35	-37
	Capital Expend	13	37	55	71	63
	Closing	478	483	505	541	567
Midlands	Opening	705	711	730	748	766
	Depreciation	-14	-48	-50	-52	-54
	Capital Expend	19	67	68	69	89
	Closing	711	730	748	766	801
Northern	Opening	392	398	414	428	446
	Depreciation	-8	-28	-30	-31	-33
	Capital Expend	14	44	44	49	58
	Closing	398	414	428	446	471
NORWEB	Opening	681	678	655	644	649
	Depreciation	-18	-62	-64	-65	-67
	Capital Expend	15	39	53	70	69
	Closing	678	655	644	649	651
SEEBOARD	Opening	429	433	449	465	493
	Depreciation	-10	-33	-35	-36	-38
	Capital Expend	14	50	51	64	45
	Closing	433	449	465	493	500
Southern	Opening	922	929	958	999	1058
	Depreciation	-18	-62	-65	-68	-72
	Capital Expend	25	91	106	127	132
	Closing	929	958	999	1058	1118
SWALEC	Opening	289	294	311	338	373
	Depreciation	-8	-27	-28	-30	-32
	Capital Expend	13	44	55	65	65
	Closing	294	311	338	373	407
South Western	Opening	464	474	501	524	542
	Depreciation	-9	-32	-33	-35	-37
	Capital Expend	19	58	57	53	53
	Closing	474	501	524	542	559
Yorkshire	Opening	725	725	717	713	717
	Depreciation	-14	-49	-50	-51	-53
	Capital Expend	13	41	46	56	54
	Closing	725	717	713	717	718
Hydro-Electric	Opening	572	584	584	586	596
	Depreciation	-30	-31	-31	-33	-34
	Capital Expend	42	30	33	42	47
	Closing	584	584	586	596	609

Notes: For the RECs' depreciation and capital expenditure was scaled by (3.5/12) in 1990/91 to take account of their flotation in mid-December 1990.

ANNEX 6: SUMMARY OF RESPONSES TO THE DECEMBER 1998 CONSULTATION PAPER ON PES BUSINESS PLANS

1.1 Twenty-seven responses were received from a range of interested parties - eleven Public Electricity Suppliers (PESs), eleven Electricity Consumers' committees (ECC's) and five others.

i) Views of Public Electricity Suppliers

Process

1.2 All PESs welcomed the increased transparency of the review process, particularly in light of the publication of the PESs' business plan information. A number commented that further transparency would be welcomed. Two PESs suggested that transparency could be improved by providing the PESs with the assumptions and conclusions made by OFFER and its consultants over the course of the review process. Another PES suggested OFFER should provide, to each PES, details of its financial modelling, together with OFFER's treatment of the PESs business plan data.

Capital and Operating Expenditure

1.3 A number of PESs commented on the wide variation between past and forecast cost projections. One PES stressed that differences in operating conditions could not explain such large variations. PESs stressed that meaningful comparisons or benchmarking of operating and capital expenditure would be difficult because of differences in: accounting policies; in the allocation of costs to different businesses; and, in differences in capitalisation policy. A number of PESs suggested that, in assessing relative efficiency, a measure of total costs (both operating and capital) should be used, rather than an analysis of each separately.

1.4 Three PESs commented that the scope for future cost reductions will be less than under the period of the existing price control as many inefficiencies have already been driven out. One PES expressed concern at the period of time over which less efficient PESs should be allowed in order to catch up with the most efficient. One PES argued that the level of allowed costs under the revised price control should be based on the PES average. It suggested that this would reward the more efficient PESs with higher returns while incentivising the less efficient PESs to reduce costs.

1.5 Two PESs commented specifically on the use of regression analysis to determine relative efficiency. They argued that if regression analysis is used it would be important to take account of PES specific factors such as the number of customers in rural areas and differential labour and property costs.

1.6 Two PESs commented on the importance of maintaining appropriate incentives towards efficiency for capital expenditure. One PES suggested that efficiency incentives should be enhanced while allowing PESs to meet future capital expenditure commitments, achieve quality of supply programmes and provide an adequate return to shareholders. One PES commented that capital expenditure programmes should be monitored to ensure the PESs are not incentivised to over-invest.

1.7 A number of PESs commented on capital expenditure underspend. One PES argued that, under the present arrangements, incentives towards efficiency for capital expenditure are reduced towards the end of the price control period. It suggested that PESs should be allowed to retain some or all of the efficiency savings beyond the period of the price control in which they were made before the benefits are passed back to customers.

Quality of Supply

1.8 Four PESs argued that OFFER should not tighten the present quality of supply standards. One PES suggested that, if the standards are tightened, there should be a focus on customers' willingness to pay. It also supported the imposition of penalties on PESs that do not meet the appropriate targets. Another PES suggested that improved quality of supply targets should focus on customers that presently experience the worst service. One PES suggested that a balance needs to be sought between the costs and benefits of any improvements to quality of supply.

1.9 A number of PESs commented that the OS1a quality of supply standard provides a disincentive to the PESs to invest in automatic fault identification and repair.

Other Issues

1.10 One PES raised a concern that the projections of future costs in the business plan questionnaire excluded the likely impact of the introduction of competition in metering and the separation of the PESs' supply and distribution businesses.

ii) Views of Electricity Consumer Committees

Process

1.11 ECCs generally welcomed the publication of the PESs' business plans. Two ECCs commented that more information should be made available unless the PESs could demonstrate that their commercial interests would be disadvantaged by doing so.

1.12 A number of ECCs appreciated the opportunity to discuss the business plans at the public hearings held between the PESs and other interested parties. These meetings covered a wide range of issues including quality of supply, past and future capital expenditure programmes and prepayment meter customers. One ECC expressed a concern that OFFER plays no formal role at these meetings.

Capital and Operating Expenditure

1.13 Four ECCs raised a concern about the variation across PESs in forecasts of operating and capital expenditure. One ECC suggested OFFER should treat PES forecasts with caution given the outperformance of previous forecasts. Two ECCs commented that there is a lack of detailed information to compare PESs historical cost performance with their future cost projections.

1.14 Two ECCs commented on the allowance for capital and operating expenditure under the price control. One suggested that the allowance for future operating expenditure should be set at the level of the most efficient PES, whereas the allowance for capital expenditure should be set at a level that allowed PESs to maintain or improve the existing quality of supply standards. One ECC supported the benchmarking of costs in assessing relative efficiency. Two ECCs argued that, in assessing relative efficiency, a measure of total costs should be used.

1.15 Ten ECCs commented on capital expenditure underspend. A number raised concerns about the lack of transparency surrounding the level of PESs' underspend. In particular, ECCs commented as to whether the level of underspend reflected genuine efficiencies. They suggested that OFFER should undertake a detailed assessment of any claims of capital expenditure efficiency savings. One ECC supported an adjustment to the price control allowance for capital expenditure underspend.

1.16 One ECC argued that the need to analyse the PESs future capital expenditure plans to ensure there is a balance between urban and rural customers, load and non-load related expenditure and shareholder returns and customer service.

1.17 Another issue raised was the impact of a possible increase in the level of network rates that PESs are liable to.

Quality of Supply

1.18 The majority of ECCs supported enhanced quality of supply targets. Three ECCs suggested that increased capital expenditure should target improvements in quality standards for the worst served customers. Another ECC suggested that OFFER's measures for network performance, which include customer minutes lost and number of interruptions, should differentiate between urban and rural areas.

1.19 Of those that commented there was broad support for the introduction of a

new standard for frequent interruptions.

1.20 Other issues raised included the need for the introduction of a new communication standard between PESs and customers in the event of faults occurring; the need for automatic compensation payments; and, the need to consider partial undergrounding of the network for environmental reasons.

iii) View of Other Parties

Process

1.21 Other parties generally welcomed the increased transparency of the review process. One respondent suggested that OFFER should publish more information from the PESs' distribution and supply business plans. One respondent suggested that OFFER should publish a project plan and a timetable for the review process.

Capital and Operating Expenditure

1.22 One respondent commented that OFFER should not accept the PESs claims that the scope for future efficiency gains are less than under the present price control. Another respondent argued that OFFER must ensure that the PES make operating cost reductions. Another respondent commented that the distribution business could reduce costs by investment in energy efficiency incentives.

1.23 One respondent supported the introduction of an error-correction mechanism to cover increases in costs beyond the scope of the PESs' control.

1.24 One respondent argued that PESs' forecasts of capital expenditure are inflated and that they should be reduced in light of the underspend against previous forecasts. One respondent expressed concern as to whether the level of underspend reflected genuine efficiencies.

Other Issues

1.25 One respondent argued that it was essential that separation of supply and distribution businesses and the introduction of competition in metering services are in place by April 2000. It also commented that no additional revenue should be allowed within the price control allowance for the separation of distribution and supply activities.

LIST OF RESPONDENTS TO THE DECEMBER 1998 CONSULTATION PAPER

1 Public Electricity Suppliers

Eastern Electricity
London Electricity
Manweb
Midlands Electricity
Northern Electric.
NORWEB - Distribution
SEEBOARD
Southern Electric
SWALEC
Scottish Hydro-Electric
ScottishPower

2 Electricity Consumers' Committees

East Midlands ECC
Eastern ECC
London ECC
Merseyside and North Wales ECC
Midlands ECC
North East ECC
North West ECC
South East ECC
South Wales ECC
South West ECC
Southern ECC
Yorkshire ECC
North Scotland ECC

3 Other Respondents

British Gas
Confederation of United Kingdom Coal Producers
Energy Saving Trust
Major Energy Users Council
South Holland District Council

ANNEX 7: SUMMARY OF RESPONSES TO JULY 1998 CONSULTATION PAPER ON PRICE CONTROLS AND COMPETITION

1.1 Fifty-one responses were received from a range of interested parties - fourteen Public Electricity Suppliers (PESs), twelve Electricity Consumers' Committees (ECC's) and the Electricity Consumers' Committees' Chairmen's Group Chairman's Group, and twenty-four others.

Views of Public Electricity Suppliers

i) Distribution and Metering Price Controls

Form, Scope and Duration of Control

1.2 All PESs supported RPI-X price control as it provides appropriate incentives towards efficiency. PESs did not support an Error Correction Mechanism (ECM). They argued that ECMs blunt incentives towards efficiency and may increase the cost of capital. Eight PESs supported revised price controls for a period of five years. Another three suggested a period at more than five years. All PESs supported the present scope of the control. PESs commented that NGC exit charges should remain an excluded service because they have no control over them.

Capital and Operating Expenditure

1.3 A number of PESs stressed that the analysis of operating costs should take account of the cost drivers and operating conditions within each PES area. PESs suggested that the scope for future cost reductions will be reduced as inefficiencies have been out. Three PESs commented that future costs will be influenced by external factors, such as year 2000 costs, EMU costs and network rates. There was a general concern amongst the PESs that the incentives provided by the price control towards capital and operational expenditure are balanced. a number of PESs suggested that, in assessing relative efficiency, a measure of total costs (operating and capital) should be used.

1.4 Six PESs suggested that capital expenditure efficiencies should be retained by the PESs for a minimum of five years, before passing benefits back to customers. A number of PESs also commented that it would be important to reward improvements in quality of supply.

Financial Issues

1.5 PESs expressed concern about certain issues being revisited during the price control review. In particular, PESs argued that there should be no change to the present approach to the valuation of distribution business assets. It was suggested that any change to the method could lead to an increase in regulatory risk which would need to be reflected in a higher cost of capital. In general, PESs supported a cost of capital higher than 7 per cent. They

commented that an increase in beta values, tax wedges and debt premiums supported this conclusion.

Energy Efficiency Issues

1.6 Eight PESs supported a continuation of the 50 per cent unit and 50 per cent customer weighting revenue driver for the revised distribution price control. Two PESs supported the MMC's recommendation in its 1997 report on NIE to increase the unit driver to 75 per cent with the remaining 25 per cent relating to customer numbers. One PES commented that a 100 per cent unit driver would encourage innovative techniques for energy efficiency, whereas one PES argued that revenue drivers do not encourage energy efficiency.

1.7 A number of PESs argued against the suggestion that the distribution business might be required to pay for losses, rather than suppliers. PESs argued that there is little scope to further reduced losses.

Metering and Related Services

1.8 Of those PESs that commented there was support for the separation of metering and meter reading service activities from the distribution business. Four PESs favoured a separate price control for metering, whereas another four PESs argued that a separate metering price control may not be needed as competition together with the Competition Act should provide adequate protection for customers. Six PESs also indicated that ownership of metering stock should remain within the distribution business because it would address the problem of stranded assets. It was also argued that any price control should include an allowance to cover the costs of any further separation of metering and the potential costs of stranded assets.

ii) Quality of Supply

Appropriateness of Present Levels of Quality of Supply

1.9 A number of PESs argued that OFFER should undertake customer research to assess the appropriate balance between improved quality of supply and prices to customers. One PES suggested that improved quality of supply targets should focus on addressing the worst served customers. Another PES suggested that quality of supply targets should focus on the frequency of supply interruptions, duration of a supply interruption and the information provided to customers on what progress is being made to restore supply. However, a number of PESs raised concerns regarding the introduction of a new communication standard; these included the practical limitations of the telephone system providers, the definition of exceptional circumstances and the different service levels for day and night. Some PESs expressed concern that engineering design standard P2/5 is not consistent with the overall standards of performance.

1.10 A number of PESs suggested that the costs of changes to the quality of supply standards should be reflected within the price control. Two PESs argued that recent changes to the standards are flawed because no cost benefit analysis was undertaken. One PES commented that any new measures should reflect the value customers place on them. Three PESs supported PES specific quality of supply targets.

Views of the Electricity Consumers' Committees

i) Distribution and Metering Price Controls

Form, Scope and Duration of Control

1.11 All ECCs supported the continuation of RPI-X price control because of its incentive properties. Eight ECCs suggested that the revised price controls should be set for a period of four to five years. Of those ECCs that commented, two supported the inclusion of all excluded services revenue within the scope of the price control, unless adequate competitive pressures can be demonstrated. Three ECCs suggested the inclusion of NGC exit charges within the scope of the price control.

1.12 The ECCs had mixed views about ECMs. Some ECCs do not support ECMs as they may create regulatory uncertainty which could lead to a higher cost of capital. However, some commented that ECMs provide a useful mechanism to re-open price controls when PESs have provided inaccurate information to OFFER.

Capital and Operating Expenditure

1.13 Of those ECCs that commented there was support for OFFER's approach to the analysis of operating costs. One ECC suggested OFFER should treat companies on a consistent basis by applying the same accounting policies across all PESs. Of those ECCs that commented on capital expenditure, concerns were raised about the lack of transparency surrounding PESs underspend compared to previous projections. Two ECCs suggested that quality of supply targets should be established alongside future capital expenditure programmes.

Financial Issues

1.14 Four ECCs supported the continuation of a 15 per cent uprate to the valuation of the distribution assets acquired at flotation. Of those that commented there was general support for a cost of capital lower than 7 per cent. The Chairman's Group argued that there should be no change to the cost of capital.

Energy Efficiency

1.15 The majority of ECCs supported greater incentives to reduce distribution losses. Two ECCs suggested the imposition of a penalty system whereby

PESs incur a penalty for losses above an agreed level. Few ECCs commented specifically on the revenue driver. Two ECCs supported a continuation of the 50 per cent unit and 50 per cent customer driver because it reduces the artificial incentive on PESs to increase electricity sales.

Metering and Related Services

1.16 Of those ECCs that commented some favoured a separate metering control whereas others believed that competitive forces would provide adequate protection for customers. One ECC argued that a separate metering price control should encourage long term investment and the development of new technology. The Chairman's Group preferred the separation of meter ownership from the supply and distribution businesses.

ii) Quality of Supply

Appropriateness of Present Levels of Quality of Supply

1.17 The majority of ECCs highlighted the importance of quality of supply. Several ECCs suggested that standards should be set so that the worst served customers would see improvements in quality of service.

1.18 A number of ECCs supported enhanced quality of supply targets. Some commented that it may be more appropriate to gradually tighten standards. Nine ECCs supported the introduction of a new standard for frequent interruptions within a twenty four hour period.

1.19 Other issues raised included, support for the retention of severe weather exemption along with a clearer definition of severe weather; the need for the introduction of a new communication standard between the PESs and customers when faults occur; and, the need to consider partial undergrounding of the network.

Views of Other Parties

i) Distribution and Metering Price Controls

Form, Scope and Duration of Control

1.20 Twelve respondents supported the continuation of RPI-X, because it has brought price reductions to customers. Six respondents supported revised price controls for a duration of 5 years, and a small number of respondents supported either 4 or 6 years. There was also some support for the inclusion of EHV and NGC exit charges within the scope of the price control.

1.21 Five respondents supported the use of ECMs. Two of which commented that the use of ECMs might avoid complex regulatory intervention. Three respondents did not support the use of ECMs.

Financial Issues

1.22 Few respondents commented specifically on financial issues. Two respondents supported the continuation of the 15 per cent up-rate to the valuation of distribution business assets. Of those that commented there was support for a cost of capital lower than 7 per cent.

Energy Efficiency Issues

1.23 There was support for the continuation of the incentive mechanism to encourage PESs to reduce distribution losses. Three respondents suggested that consideration needs to be given as to whether the distribution business should be made responsible for meeting the costs of losses rather than suppliers. One respondent suggested that environmental implications should be given considerable weight, and OFFER should consider the environmental impact of their regulatory work. They also supported the introduction of environmental targets or standards.

Metering and Related Services

1.24 Of those that commented there was support for the separation of meter operation and meter reading activities from the distribution business. One respondent suggested the introduction of an incentive to increase investment in new metering technology. Four respondents supported competition in metering because it would create efficiency and encourage the development of new technology.

ii) Quality of Supply

Appropriateness of Present Levels of Quality of Supply

1.25 The majority of those that commented highlighted the importance of quality of supply. Overall, the respondents stressed that more detailed targets should be set and that these should be more rigorous than the present targets. Five respondents noted discrimination between industrial and domestic users in relation to service interruptions.

1.26 A number of respondents stressed that payments under the standards should be automatic and one respondent suggested that compensation to industrial users would incentivise the PESs to improve performance.

LIST OF RESPONDENTS TO THE JULY 1998 CONSULTATION PAPER

1 Public Electricity Suppliers

Eastern Electricity
East Midlands Electricity
London Electricity
Manweb
Midlands Electricity
Northern Electric.
NORWEB - Distribution
NORWEB - Supply
Scottish Hydro-Electric
ScottishPower
SEEBOARD
Southern Electric
Southern Western Electric
SWALEC
Yorkshire Electricity

2 Electricity Consumers' Committees

ECCCG
East Midlands ECC
Eastern ECC
London ECC
Merseyside and North Wales ECC
Midlands ECC
North East ECC
North West ECC
South East ECC
South Wales ECC
South West ECC
Southern ECC
Yorkshire ECC
North Scotland ECC

3 Other Respondents

A H Shaw
Association for the Conservation of Energy
Association of Electricity Producers
BCN Data Systems
BOC Gases
British Gas
British Steel
Chemical Industries Association
Confederation of United Kingdom Coal Producers

Connect South West Limited
Customers' Association
Econnect Ltd
Electricity Association
Energy Action Scotland
Energy Intensive Users Group
Enron Europe
IVO Energy
Lord Jenkin of Roding
Major Energy Users Council
National Consumer Council
National Right to Fuel Campaign
Peak District National Park Authority
Public Utilities Access Forum
Royal National Institute for the Blind
Scottish Consumer Council