



**REVIEWS OF
PUBLIC ELECTRICITY SUPPLIERS
1998 TO 2000**

**BUSINESS PLANS FOR
TRANSMISSION BUSINESSES IN SCOTLAND**

**CONSULTATION PAPER
FEBRUARY 1999**

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FOREWORD

In July 1998 OFFER issued a consultation paper on price controls and competition in the present programme of reviews. This described the main considerations likely to be relevant and set out the proposed approach to the following areas of work:

- distribution and metering price controls;
- quality of supply standards;
- competition and supply price restraints;
- Scottish transmission price controls; and
- prepayment meter customers.

This consultation paper deals with certain issues relating to the setting of the Scottish transmission price controls. A consultation paper for the distribution price controls was issued in December 1998. In setting price controls it is necessary to consider the level of operating costs and capital expenditure that an efficient company might need to incur.

As part of this process, the companies have been asked to complete business plan questionnaires for their transmission businesses. This consultation paper sets out information submitted by the companies in response to the business plan questionnaires and includes information on operating costs and capital expenditure over the period until 2004/05. All information in this consultation paper has been provided by the companies to enable OFFER consumer representatives and others to scrutinise their proposals. At this stage no view has been taken about the appropriateness, or otherwise, of the information, or whether the costs are reasonable.

Chapter 1 contains an overview of the information provided by companies. Chapters 2 and 3 contain summary narratives prepared by each company on actual operating costs and capital expenditure over the period 1994/95 to 1997/98 and its projections for the period 1998/99 to 2004/05.

As the price control reviews progress it will be necessary to take an independent view as to the appropriate level of operating costs and capital expenditure. Responses to this consultation paper will help inform these judgements. Consultants have been appointed to assist with the analysis of operating costs and capital expenditure. Further information will be published later in the reviews summarising the results of this analysis.

Each Electricity Consumers' Committee will be holding a public meeting with its local company during February. These meetings will provide an opportunity for the companies to explain their forecasts of operating costs and capital expenditure. They will also provide the opportunity for Committee members, customers and other interested parties to

question the companies about their future plans. Further details of these meetings can be obtained by contacting the Committees Secretary on 0141 331 2552 or by writing to the address below.

Views are invited from those with an interest in these issues, including customers, their representatives and other interested groups as well as the companies themselves and other suppliers. Responses which should be received by 9 March 1999 should be addressed to:

Mr David Wilson
Deputy Director General
Office of Electricity Regulation
Regent Court
70 West Regent Street
Glasgow
G2 2QZ

Fax No: 0141 331 2777

E Mail: lmcdermid@offer.gov.uk

OFFER will publish all responses to this consultation by placing them in the OFFER Library. Any general queries about the contents of this paper can be raised with Paul Dudley at the above address in the first instance (telephone contact 0141 333 9271).

OFFICE OF ELECTRICITY REGULATION

February 1999

1. OVERVIEW

Introduction

- 1.1 In Scotland, Scottish Hydro-Electric and ScottishPower own and operate the network which transfers the power station output to the customer's premises. This network consists of the high voltage transmission system (132 kV and above) and the distribution system (below 132 kV). Most of the transmission and distribution services provided by the two public electricity suppliers (PESs) are not subject to competition, with customers' interests protected by regulation and price controls. Separate price controls are in place for each PES and their respective regulated distribution and transmission services.
- 1.2 Distribution price controls were put in place in 1994 and 1995 and then modified in 1997 to allow PESs to make certain additional charges for services to facilitate competition in supply. New distribution price controls are due to be in place from April 2000. A recent consultation paper entitled 'PES Business Plans' by OFFER (December 1998) contains a summary of information that has been submitted by the distribution businesses in England, Wales and Scotland for review in determining the new distribution price controls.
- 1.3 Scottish transmission price controls were put in place in 1994 and then modified in 1997 to extend the price controls by one year. A new transmission price control is due to be in place from April 2000. This consultation paper contains a summary of information that has been submitted by the Scottish companies for review in determining the new transmission price controls. At this stage no view has been taken about the appropriateness or otherwise of the information or whether the costs are reasonable.
- 1.4 Setting a price control, whatever its precise form, requires an estimate of the revenue that would be sufficient to finance an efficient business. Therefore it is necessary to consider the level of operating costs and capital expenditure, over the period of the control, that an efficient company might need to incur, and the appropriate level of return to shareholders and other providers of capital. The subsequent chapters (Chapters 2 and 3) contain summary narratives prepared by each company on actual operating costs and capital expenditure over the period 1994/95 to 1997/98 and its projections for the period 1998/99 to 2004/05.
- 1.5 OFFER has appointed consultants to assist with the analysis of costs. These consultants are assisting in the price control reviews of both transmission and distribution, which will enable them to take account of the joint services within transmission and distribution. Over the next few months the consultants will analyse the business plans and discuss with each transmission business whether the costs within the plans represent an efficient level given the operating conditions in the respective areas.

- 1.6 The proposed levels of allowed revenue for the next price control will be formed taking account of the activities, performance and finance of the Scottish companies' transmission businesses. OFFER will set out its proposals for the new transmission price controls in a subsequent consultation paper.

The Transmission Businesses Within the Industry Structure

- 1.7 The transmission businesses are part of the vertically integrated business activities of Scottish Hydro-Electric and ScottishPower. Separation of transmission ownership and/or operation from the other business activities of the Scottish companies is under consideration and was discussed in OFFER's recent consultation paper entitled 'Business Separation' (December 1998). The establishment of a separate and independent system operator is an option that is being considered as part of a possible revision of trading arrangements for Scotland and was discussed in OFFER's recent consultation paper entitled 'Trading Arrangements' (December 1998).
- 1.8 Proposals for the separation of the transmission businesses will need to be further developed before the effect on the attribution and allocation of costs between transmission, generation, distribution and supply business activities becomes clear. The projections in this paper have been made on the basis of the existing definitions of businesses. These involve the provision of joint services between transmission and distribution and the inclusion of system data provision and generation registration system costs within the transmission business.
- 1.9 As the reviews progress it may be necessary to adjust the present attributions and allocations of costs in order that proposals for revised price controls reflect any new arrangements for separation of businesses. Any additional costs of separation will need to be assessed in the context of the potential improvements in management control and efficiency and the scope for increase in shareholder value which might be realised by the possibility of demerging businesses and of potential merger and acquisition activity.

The Characteristics of the Transmission Businesses

- 1.10 The transmission businesses in Scotland differ from transmission business in England and Wales. In Scotland the networks at 132 kV and above are owned and operated by the transmission businesses of Scottish Hydro-Electric and ScottishPower, but in England and Wales the network at 132 kV is owned and operated by the PES distribution businesses and the network above 132 kV is owned and operated by the National Grid Company.

- 1.11 Some of the physical characteristics of the transmission networks are summarised in Table 1. Scottish Hydro-Electric's network consists of a main 275 kV line through the Highlands with several 132 kV line spurs; ScottishPower's network consists primarily of 275 kV line ring circuits in the Lowlands and 400 kV line links to the Scotland-England Interconnector, integrated with 132 kV lines.
- 1.12 The characteristics and development of Scottish Hydro-Electric's and ScottishPower's transmission networks influence the level of operating costs and capital expenditures. Although it is conventional and convenient to break down spending between operating costs and capital expenditure it will also be important to consider the relationship between the two categories of expenditure. For instance, investment in information technology and control systems may reduce the costs of operating and maintaining the network, suitable maintenance may prolong life and enable capital expenditure to be deferred and increased capital expenditure may reduce the costs of maintenance.
- 1.13 The presentation and allocation of operating costs and capital expenditures will also reflect accounting policies and conventions. For instance, a company may buy services from either affiliated companies or third parties and treat the costs as either direct operating costs or costs to be capitalised as non-operational expenditure.

TABLE 1 COMPANY INFORMATION FOR 1997/8

Company	Area (Sq. km)	Distribution and transmission customers (000s)	Transmission circuit length (km)	Percentage of transmission circuits underground (%)	System maximum demand (MW)
Scottish Hydro-Electric	54,000	640	4,730	1	1,555
ScottishPower	22,950	1,860	4,084	6	4,172

Operating Expenditures

- 1.14 The Scottish companies have provided historic and projected levels of operating costs for the period from 1994/95 to 2004/05 for the review of the transmission price control and these are shown in Table 2. This period covers that of the existing and extended price control to March 2000 and a possible new five-year price control from April 2000. Both Scottish Hydro-Electric and ScottishPower project the average annual operating expenditure for the five years from April 2000 in real terms to be 17 to 18 per cent above the average during the preceding six years.
- 1.15 The operating costs include the costs of labour, materials, depreciation, rates and insurance. The accounting treatment of depreciation and projected level of rates

influence the overall level of operating costs. The removal of depreciation and rates from the operating costs show the underlying levels of cost for operating the transmission businesses as projected by the companies.

- 1.16 The companies projected level of network depreciation for 1994/95 to 2004/05 is shown in Table 3 and includes depreciation on the network within each companies designated areas and on their share of the Interconnector. The real increases in the average annual level of operating cost for the five years from April 2000 relative to the average during the six years preceding April 2000 are in the order of 30 to 50 per cent for Scottish Hydro Electric and ScottishPower. Part of this increase arises from the upgrade of the Scotland-England Interconnector. Most of Scottish Hydro-Electric's projected increase relates to the network within the company's designated area, whilst ScottishPower's projected increase is shared between the network within the company's designated areas and the Interconnector.
- 1.17 The companies projected level of total depreciation for 1994/95 to 2004/05 is shown in Table 4 and includes depreciation on the network and depreciation on non-operational capital expenditure. The projected level of total depreciation is dominated by the network depreciation and hence the comparative changes in total depreciation broadly reflect those in network depreciation. The real increases in the average annual level of operating cost less total depreciation for the five years from April 2000 relative to the average during the six years preceding April 2000 are 27 to 33 per cent for Scottish Hydro-Electric and ScottishPower.
- 1.18 The companies projected level of operating cost less total depreciation for 1994/95 to 2004/05 is shown in Table 5. The projected real increases in the average annual level of operating cost less total depreciation for the 5 years from April 2000 relative to the average during the six years preceding April 2000 are 12 to 13 per cent for Scottish Hydro-Electric and ScottishPower.
- 1.19 The companies projected levels of operating cost less network depreciation and rates for 1994/95 to 2004/05 are shown in Table 6. Both Scottish Hydro-Electric and ScottishPower project the rates to increase in real terms in the period from 1994/95 to 2004/05, with the increase projected by ScottishPower considerably more than that projected by Scottish Hydro-Electric. The real change in the average annual level of operating cost less network depreciation and rates for the five years from April 2000 relative to the average during the six years preceding April 2000 is 16 per cent for Scottish Hydro-Electric and 6 per cent for ScottishPower. Hence both Scottish Hydro-Electric and ScottishPower project real annual increases in the operating cost less network depreciation and rates during the five years from April 2000 when compared to the six years preceding April 2000.

TABLE 2 ACTUAL LEVELS AND COMPANY PROJECTIONS OF TRANSMISSION BUSINESS OPERATING COSTS (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	29	28	26	29	28	30	28
ScottishPower	58	53	50	50	53	54	53

Company	Possible New Price Control Period					Average B	Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	32	34	34	34	33	33	18
ScottishPower	57	62	63	63	64	62	17

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

TABLE 3 ACTUAL LEVELS AND COMPANY PROJECTIONS OF TRANSMISSION BUSINESS DEPRECIATION ON NETWORK ASSETS (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	4	4	4	4	4	5	4
ScottishPower	10	10	10	10	10	11	10

Company	Possible New Price Control Period					Average B	Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	6	6	7	7	6	6	50
ScottishPower	12	12	13	13	14	13	30

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

TABLE 4 ACTUAL LEVELS AND COMPANY PROJECTIONS OF TRANSMISSION BUSINESS TOTAL DEPRECIATION (IE. DEPRECIATION ON NETWORK AND NON-OPERATIONAL ASSETS) (£ MILLION IN 1997/98 PRICES)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	8	5	5	5	5	7	6
ScottishPower	10	10	11	11	11	12	11

Company	Possible New Price Control Period					Average B	Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	7	8	8	8	7	8	33
ScottishPower	13	14	14	15	16	14	27

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

TABLE 5 ACTUAL LEVELS AND COMPANY PROJECTIONS OF TRANSMISSION BUSINESS OPERATING COSTS LESS TOTAL DEPRECIATION (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	20	23	21	24	23	24	23
ScottishPower	48	42	39	39	41	42	42

Company	Possible New Price Control Period					Average B	Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	25	26	26	26	26	26	13
ScottishPower	44	48	48	48	48	47	12

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

TABLE 6 ACTUAL LEVELS AND COMPANY PROJECTIONS OF TRANSMISSION BUSINESS OPERATING COSTS LESS TOTAL DEPRECIATION AND RATES (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	17	19	17	20	20	20	19
ScottishPower	37	32	29	28	30	31	31

Company	Possible New Price Control Period					Average B	Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	21	22	22	22	22	22	16
ScottishPower	30	33	33	33	33	33	6

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

Capital Expenditures

- 1.20 The Scottish companies have provided historic and projected levels of gross capital expenditures for the period from 1994/95 to 2004/05 for the review of the transmission price control and these are shown in Table 7. This period covers that of the existing and extended price control to March 2000 and possible new five-year price controls from April 2000. The companies' projected, real increases in the average annual level of gross capital expenditures for the five years from April 2000 relative to the average during the six years preceding April 2000 are 19 per cent for Scottish Hydro-Electric and 67 per cent for ScottishPower.
- 1.21 Capital expenditure on transmission networks can be split between that required to expand the system to accommodate new customers or to cater for shifts in the geographic pattern of demand and generation (load-related expenditure), that required to replace existing network assets (non-load related expenditure). In addition the transmission business may have expenditure for assets other than those of the network (non-operational assets). When a new generator or customer is connected to the network or an existing generator or customer wishes to upgrade their connection the company make connection charges to these generators and customers. These charges can be treated as a capital receipt and be netted off the gross capital expenditure to form the net capital expenditure. The existing price control was set on the basis of funding net capital expenditure.
- 1.22 The load-related, non-load related and non-operational capital expenditures that form the gross capital expenditures in Table 7 are shown in Tables 8, 9 and 10

respectively. A comparison of the level of expenditures before and after April 2000 shows that the load related and non-load related expenditures increase and the non-operational expenditure decrease in real terms after 2000, and the greatest percentage increase to be in load related expenditure.

- 1.23 Customer contributions are shown in Table 11 and net capital expenditures (namely gross capital expenditure less customer contributions) are shown in Table 12. A comparison of the level of customer contributions before and after April 2000 shows an increase in real terms after 2000. The companies' projected real increases in the average annual level of net capital expenditure for the five years from April 2000 relative to the average during the six years preceding April 2000 are 7 per cent for Scottish Hydro-Electric and 59 per cent for ScottishPower. Hence, Scottish Hydro-Electric and ScottishPower project an increase in net capital expenditure, with a considerable increase projected by ScottishPower.

TABLE 7 ACTUAL LEVELS AND COMPANY PROJECTIONS OF TRANSMISSION BUSINESS GROSS CAPITAL EXPENDITURE (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						<i>Average A</i>
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	17	11	14	14	16	24	16
ScottishPower	18	24	24	37	36	41	30

Company	Possible New Control Period					<i>Average B</i>	Percentage Change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	25	16	18	18	16	19	19
ScottishPower	57	66	41	47	39	50	67

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

TABLE 8 ACTUAL LEVELS AND COMPANY PROJECTIONS OF TRANSMISSION BUSINESS LOAD-RELATED CAPITAL EXPENDITURE (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	1	3	4	1	4	12	4
ScottishPower	1	8	14	9	6	12	8

Company	Possible New Price Control Period					Average B	Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	13	5	7	8	5	8	100
ScottishPower	28	39	15	14	4	20	150

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

TABLE 9 ACTUAL LEVELS AND COMPANY PROJECTIONS TRANSMISSION BUSINESS NON LOAD-RELATED CAPITAL EXPENDITURE (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	7	7	8	11	11	10	9
ScottishPower	17	15	9	27	28	28	21

Company	Possible New Price Control Period					Average B	Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05		
Scottish Hydro-Electric	11	10	10	9	9	10	11
ScottishPower	29	26	26	33	34	29	38

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

**TABLE 10 ACTUAL LEVELS AND COMPANY PROJECTIONS
TRANSMISSION BUSINESS NON-OPERATIONAL CAPITAL
EXPENDITURE (1997/98 PRICES £ MILLION)**

Company	Existing and extended Price Control Period						
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	Average A
Scottish Hydro-Electric	9	1	2	2	1	2	3
ScottishPower	0	1	1	1	2	1	1

Company	Possible New Price Control Period						Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05	Average B	
Scottish Hydro-Electric	1	2	1	1	2	2	-33
ScottishPower	1	1	1	1	1	1	0

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

**TABLE 11 ACTUAL LEVELS AND COMPANY PROJECTIONS
TRANSMISSION BUSINESS CUSTOMER CONTRIBUTIONS
(1997/98 PRICES £ MILLION)**

Company	Existing and extended Price Control Period						
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	Average A
Scottish Hydro-Electric	0	0	0	0	1	10	2
ScottishPower	1	1	1	1	2	2	1

Company	Possible New Control Period						Percentage change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05	Average B	
Scottish Hydro-Electric	4	2	5	5	2	4	100
ScottishPower	1	15	0	2	0	4	300

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 COMPANY PROJECTIONS

TABLE 12 ACTUAL LEVELS AND COMPANY PROJECTIONS TRANSMISSION BUSINESS GROSS CAPITAL EXPENDITURE LESS CUSTOMER CONTRIBUTIONS (1997/98 PRICES £ MILLION)

Company	Existing and extended Price Control Period						Average A
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	
Scottish Hydro-Electric	17	11	14	14	15	14	14
ScottishPower	17	23	23	36	34	40	29

Company	Possible New Control Period						Percentage Change B on A
	2000/01	2001/02	2002/03	2003/04	2004/05	Average B	
Scottish Hydro-Electric	21	14	13	13	14	15	7
ScottishPower	56	51	41	45	39	46	59

SOURCE: 1994/95 TO 1997/98 ACTUAL; 1998/99 TO 2004/05 PES PROJECTIONS

Quality of Supply

- 1.24 The quality of supply to a customer reflects the extent to which the electrical flows through the network are uninterrupted. The quality of supply is influenced by a number of factors which include the geography of the areas where customers are located and the prevailing weather conditions. The level of quality of supply attained by the companies is also influenced by the operating practices and capital expenditure programmes of the transmission and distribution businesses. The quality of supply for the distribution business was discussed in OFFER's recent consultation paper entitled 'PES Business Plans' (December 1998) and the quality of supply for the transmission business is discussed below.
- 1.25 OFFER monitors the transmission system performance of Scottish Hydro-Electric, ScottishPower in Scotland and the National Grid Company in England and Wales. System performance is measured in several ways including the number of incidents of faults that result in a loss of supply to one or more customers, the level of unsupplied energy from the incidents of faults and the percentage of time when the transmission circuits are out of service for maintenance, system construction, user connection or faults. Details of PES performance on quality of supply are set out in OFFER's 'Report on Distribution and Transmission System Performance 1997/98' published in November 1998.
- 1.26 The numbers of transmission fault incidents that resulted in a loss of supply to one or more customers a year from 1992/93 to 1997/98 are shown in Table 13 for

Scottish Hydro-Electric, ScottishPower and, for comparison, the National Grid Company (NGC). The average annual number of incidents for Scottish Hydro-Electric and ScottishPower from 1991/92 to 1997/98 are 14 and 8 respectively and for the five years to 1997/98 the number of incidents has been at or below the average of the seven-year period. The corresponding average annual number of incidents for NGC is 10.

TABLE 13 TRANSMISSION NETWORK SECURITY OF SUPPLY: NUMBER OF INCIDENTS

Company	Year							Average
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	
Scottish Hydro-Electric	16	28	7	14	11	11	8	14
ScottishPower	8	15	4	7	7	7	6	8
NGC	9	9	8	8	5	14	14	10

TABLE 14 UNSUPPLIED ENERGY FROM TRANSMISSION INCIDENTS: GWH

Company	Year							Average
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	
Scottish Hydro-Electric	0.12	0.31	0.07	0.16	0.09	0.09	0.16	0.14
ScottishPower	0.05	0.18	0.50	0.28	0.05	0.04	0.02	0.16
NGC	0.20	0.72	0.48	0.08	0.17	0.08	0.44	0.31

TABLE 15 ANNUAL UNAVAILABILITY: %

Company	Year							Average
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	
Scottish Hydro-Electric	2.4	3.4	2.9	2.2	3.2	2.6	2.5	2.7
ScottishPower	3.4	3.5	2.2	2.3	2.9	2.4	3.2	2.8
NGC	9.0	7.0	5.8	4.9	4.1	4.2	3.7	5.5

- 1.27 The levels of unsupplied energy arising from transmission incidents a year from 1992/93 to 1997/98 are shown in Table 14 for Scottish Hydro-Electric, ScottishPower and, for comparison, NGC. The average annual levels of unsupplied energy for Scottish Hydro-Electric and Scottish Power from 1991/92 to 1997/98 are 0.14 and 0.16 GWh respectively. The average annual level of unsupplied energy for NGC from 1991/92 to 1997/98 is 0.31 GWh and exceeds the corresponding values for the two Scottish companies primarily because of the relatively higher customer density in England and Wales.
- 1.28 A summary of some research by the companies in customers' views of quality of supply was made in the recent consultation paper entitled 'PES Business Plans' (December 1998). Scottish Hydro-Electric said that 90 per cent of its customers are satisfied with the quality of supply and the number of complaints are falling, in support of its existing programme for improving quality of supply. ScottishPower said that the majority of customers would be willing to forego some reduction in the price of electricity for improvements in the quality of supply, but they would be unwilling to see price increases.
- 1.29 For the transmission business plans the companies have had the opportunity to present the costs of a base case scenario, in which the existing quality of supply is maintained into the future, and the costs of an alternative case, in which the quality of supply is improved above existing levels. The costs of the base cases for Scottish Hydro-Electric and ScottishPower are shown in Tables 2.12. Scottish Hydro-Electric has not presented an alternative to the base case within its submission for consideration of the transmission price control and has presented its views on quality of supply issues primarily within its submission for the distribution price control. ScottishPower has presented an alternative to the base case, within its submission for consideration of the transmission price control, which consists of its base case costs with an overall 5 per cent uplift on the level of net capital expenditure for the five years to 2004/05.

Additional Issues

- 1.30 Further to taking an independent review of operating costs and capital expenditure, the transmission price control review will also consider the following:
- form, scope and duration of the new price controls;
 - asset valuation and rate of return;
 - hydro benefit;
 - structure of transmission charges.

These issues were raised in OFFER's 'Price Controls and Competition' consultation paper in July 1998.

2. SCOTTISH HYDRO-ELECTRIC'S NARRATIVE

Introduction

- 2.1 Scottish Hydro-Electric has provided the following summary of transmission operating costs to highlight the efficiency improvements achieved and the likelihood for future improvement.
- 2.2 In 1992, transmission (which included Telecoms activities) formed part of Scottish Hydro-Electric's Production and Engineering Division along with the company's generation activities, whilst distribution was part of Public Electricity Supply, along with the electricity supply activities.
- 2.3 Increasing regulatory pressure to separate the monopoly wires businesses from the competitive generation and supply activities led to the formation of Power Systems. This new division, responsible for all distribution and transmission activities allowed Scottish Hydro-Electric to demonstrate the required business separation to the regulatory authorities. In addition, economies of scale and customer service improvements were maximised by merging activities common to the two businesses.
- 2.4 A further driver for these changes was the need to exploit any available means of improving efficiency in operating a network that delivers energy across 25 per cent of the landmass of the United Kingdom, but to only 2 per cent of its population.

Summary of Operating Costs over the period from 1994/1995 to 2004/2005

- 2.5 This narrative explains the levels and trends in transmission operating costs contained in [Table 2A \(Page 24\)](#). The same information is presented in [Table 2B \(Page 25\)](#) in 1997/98 prices.
- 2.6 During the current price control period, a number of management initiatives have been implemented, all of which have had an impact on the operating costs of the transmission business.

Organisational Changes

- 2.7 A number of changes have been implemented during the period from 1994/1995 to 1997/1998, all with a view to reducing the costs of operating Power Systems' businesses.
- 2.8 Districts have been restructured, with the introduction of "Team Working" concepts effectively removing a layer of management from the Districts. With increased emphasis on the core distribution and transmission activities, Team Working and "Core-Hours Working" principles have increased the flexibility of the

Districts in meeting the needs of customers, allowing customer service improvements.

- 2.9 In parallel with the Districts' restructure, several strategic transmission and distribution functions were centralised, specifically Transmission Repair and Maintenance (R&M) and control of Power Systems Capital Projects. Whilst out sourcing of R&M work has been hampered by limited availability of suitable contractors, efficiency improvements have been achieved by rationalisation of the various Districts' Transmission R&M teams into a single specialist team, responsible for the entire Scottish Hydro-Electric transmission network. Centralisation of Capital Project work has allowed tighter control over the delivery of the significant refurbishment plans designed to improve network performance. Cost improvements have also been achieved as all construction work for capital projects is now carried out by external contractors. In addition, more than 50 per cent of projects are now planned and site-managed by the contractor carrying out the construction work.
- 2.10 The final significant reorganisation that has taken place during this price control review period is that of Network Control. The five control rooms previously relied on by Power Systems (one of which was responsible for Transmission System Control) have been rationalised to a single control room, with a consequent reduction in staffing levels. This centralisation of control room activity represents optimum cost performance in this area.
- 2.11 Whilst these organisational changes have delivered real cost reductions during this review period, Scottish Hydro-Electric argue that it is unlikely that equivalent cost reductions will be possible in the near future. Extreme geographical conditions and a very widespread network mean that the scope for economies of scale in these areas is limited.

Other Management Initiatives

- 2.12 A variety of further initiatives have led to cost reductions during the current price control period, a number of which are outlined below.
- 2.13 Job evaluation of posts throughout Scottish Hydro-Electric has ensured that salaries for jobs within Power Systems are in line with the accountabilities of the post and are based on market rates.
- 2.14 The recently revised car policy for non-operational vehicles restricts the issue of cars and the specification of cars available. As a result, the number of cars in the fleet will be reduced, whilst the cost per car will also fall as lower specification vehicles become the norm. It is anticipated that transport costs will fall as a result of these initiatives.

- 2.15 Policies for travel, accommodation and entertainment expenses are based on reimbursement of reasonable costs, with the onus to produce receipts lying with staff claiming these expenses. All travel and accommodation is booked through the company's appointed travel agency, with the emphasis being on "standard" or "economy" services.

Evidence of Efficiency Improvements

- 2.16 All of the initiatives and changes described above have contributed to the following efficiency improvements which have been achieved during the years of the present price review period.
- 2.17 Payroll cost per employee has fallen from £31,000 in 1994/1995 to £24,000 in 1997/1998. Taken along with capital employed per employee (see below), this is indicative of a move towards a more capital intensive and less labour intensive organisation.
- 2.18 Controllable transmission operating cost per employee (ie, excluding depreciation, rates and "other" costs, mainly comprising fixed contract costs - see other costs section, below) has fallen from £59,000 in 1994/1995 to £47,000 in 1997/98.
- 2.19 Fixed assets employed per employee have risen from £914 in 1994/1995 to £968 in 1997/98.
- 2.20 Further efficiency improvements in payroll and controllable operating costs are projected for the period to 2004/2005, as follows:
- Payroll cost per employee is forecast to fall to £16,000 by 2004/2005
 - Controllable transmission operating cost (ie excluding rates, depreciation and "other" costs) per employee is projected to fall to £32,000 by 2004/2005.

Benchmarking

- 2.21 A benchmarking exercise commissioned by Scottish Hydro-Electric and carried out by HELCOR compared Scottish Hydro-Electric's Transmission and Power Systems activities with those of Scandinavian wires businesses.
- 2.22 Scottish Hydro-Electric was found to be one of the most efficient companies in comparable parts of northern Europe for overhead line maintenance. In addition, performance in various management functions, such as tariff setting and finance, showed that costs for Power Systems were lower than those of comparable benchmark companies in northern Europe.
- 2.23 One area identified by benchmarking as a source of potential efficiency improvement was Reliability Centred Maintenance. This opportunity can now be

exploited, as the new Asset Management database implemented by Power Systems during 1998 incorporates the whole-life costs of assets. This will allow expenditure to be focused on the assets that will deliver optimum cost benefit.

Control of Operating Costs

(i) Rates

2.24 The rates burden for the core regulated businesses has risen in real terms in the past few years, as rateable values have risen and “pence” rates have increased with the Retail Price Index (RPI).

2.25 The Wood Committee is yet to report. However, past precedents in the field of business-rating make it likely that when the basis for valuations changes in 2000, the rates burden on Scottish Hydro-Electric and on its transmission business will continue to increase in real terms. As this is a largely uncontrollable cost, a continuation of RPI+2 per cent for rates, as per the 1994/99 transmission price control review, has been projected for the period to 2004/05.

(ii) Insurance

2.26 Scottish Hydro-Electric reviews its insurance cover on an annual basis, and seeks to obtain economies of scale by taking out policies at a company, rather than individual business level where appropriate. Insurance costs for the transmission business have been constant in real terms in the period from 1994/1995 to date.

2.27 Since the last review, insurance has been an area of increasing Government taxation, with tax on insurance premia having been introduced and subsequently raised. In addition, any separation of Scottish Hydro-Electric’s businesses that prohibits the use of “corporate” policies is likely to lead to real increases in insurance costs.

2.28 With these upward pressures on the cost of insurance, containing costs at current levels will be a challenging target. Hence, no efficiency gains are projected in this area.

(iii) Wayleaves

2.29 Wayleave payments are renegotiated annually, between the ESI and the NFU/Country Landowners’ Federation. The underlying methodology used to assess payments was called into question by the NFU/CLF, with all parties agreeing to go to arbitration. As a result wayleave payments have increased significantly since 1994. The formula agreed for future assessment does mean, however, that payments are expected to remain at a fairly steady level for the foreseeable future.

2.30 The current level of costs for wayleaves can, therefore, be expected to continue into the next review period, such that real terms reductions in these costs are unlikely to be achieved.

(iv) **Information Systems / Information Technology**

2.31 This area has been greatly affected by a number of factors. Supply deregulation has led to the introduction of new systems for which maintenance and support contracts will be required. In addition, these systems will lead to increased depreciation in the transmission business in the next few years. The introduction of a new Network Support System will lead to similar increases in operating costs, whilst upgrades and replacement of systems and hardware to ensure year 2000 compliance will mean further increases in depreciation for these new assets. For the next price review period, non-payroll IT costs are projected to remain constant, at a level below that for the current period, as preparation for market deregulation, year 2000 and European Monetary Union tails off. The increase in transmission depreciation forecast is due in part to the depreciation of the new systems implemented.

(v) **The Effect of Capital Projects on Operating Costs**

2.32 As a consequence of increased activity in capital projects aimed at improving network performance, depreciation of transmission assets will increase, as old, depreciated assets are replaced by new ones. This capitalisation of work is the other main contributor to the projected increase in depreciation for the transmission over the next price control period. The reduction in material costs forecast is also caused in part by the anticipated increase in capital activity.

(vi) **Other Costs**

2.33 Substantial parts of the transmission business operating costs are shown as "other costs" in [Tables 2A and 2B](#). Nearly all these costs are long term, contractual commitments associated with the restructuring contracts. The purpose of the contracts is to secure Scottish Hydro-Electric's share of interconnector capacity through ScottishPower's area and into NGC's area. The interconnection is vital to provide system security, as well as providing an opportunity for generators in Scottish Hydro-Electric's area to access the England and Wales market, or for suppliers to purchase from that market. These contract costs are not therefore a controllable cost of the transmission business.

Summary of Capital Expenditure Over the Period from 1994/1995 to 2004/2005

2.34 This narrative explains the levels and trends in transmission capital investment contained in [Table 2C \(Page 26\)](#). The same information is presented in [Table 2D \(Page 27\)](#) in 1997/98 prices.

Load-Related

2.35 This category covers reinforcement of the transmission infrastructure, and new work required to connect new generation or load sites to the infrastructure. In the period to March 1998, all of the expenditure has been reinforcement, as there have been no new connections to the system. From April 1998 there are several committed and planned new connections for generation, reflecting the growth in renewables through the various Government orders plus other generation connections. This totals some £18 million of the £31 million load-related expenditure forecast for the period 2000 to 2005, and a further £10 million is forecast for 1999/2000 for new connection assets to accommodate the repowering of Peterhead power station.

2.36 Some of the reinforcement expenditure planned at the last price control has been deferred by successful load management, while others have been achieved at lower cost by re-engineering. One major project was deferred to allow other options to be investigated, and a revised project involving an additional 132 kV circuit has now been approved.

2.37 Reinforcement continues to be required in response to general load growth, the potential loss of control of time switches leading to less effective load management and to improve system performance. Specific major projects include:

- reinforcement of the circuits between Fort Augustus on the mainland and Broadford on the Island of Skye
- installation of static voltage compensators on the circuit to the Western Isles
- replacement of overloaded Supergrid transformers at Beaully and Keith.

2.38 Load-related expenditure also includes investment on upgrades to the Scotland-England Interconnector. The 1994 to 1998 period saw the completion of the works on the Scottish part of the first upgrade to 1600 MW, although the full capacity has yet to be realised due to the limitations of the NGC infrastructure. Works also commenced on the second upgrade to 2200 MW, although this is now in suspension since the final stages of this work are again dependent upon NGC's infrastructure work. This is now planned to be completed in 2001, and the capital expenditure forecast includes £7.5 million (nominal) to complete the Scottish Works on the upgrade. Expenditure on interconnector upgrades is financed through inter business recharges to the wholesale business rather than from use of system revenues.

Non-Load Related

- 2.39 This category covers general refurbishment and replacement of older assets in accordance with an overall asset management strategy aimed at ensuring continued high performance of the transmission network. In the current price review period, the physical targets of plant replacement established at the last price control review (ie, 80 km of line, seven transformers, and nine circuit breakers a year) have been achieved. Cost savings of around 20 per cent of the forecast levels have been achieved in reaching these targets. These savings have resulted from a combination of factors; purchasing policy, competitive prices, and redesign to optimise the network configuration making full use of the integrated nature of the transmission and distribution network in Scottish Hydro-Electric.
- 2.40 The continuing requirements have been carefully assessed against the prevailing prices and incorporated into the planned capital expenditure for the forthcoming period. For the forthcoming period, an increase to 100 km a year of line refurbishment will be required, but transformer replacement will reduce to four a year. Switchgear replacement of 10 a year includes the first items of 275 kV switchgear with five air blast circuit breakers scheduled to be replaced with modern SF6 designs. Condition monitoring of the cable network has led to a decision to invest some £6 million in replacing unreliable 132 kV gas compression cables as the first phase of a planned replacement strategy. This decision has been further reinforced by the problems experienced by the electricity company in Auckland, New Zealand.

Non-Operational

- 2.41 This category covers tools and equipment, land, buildings, furniture and fittings and corporate allocations. Approximately £0.2 million a year covers purchase and replacement of specialist tools and equipment and network analysis computers and software. The remainder is the transmission business share of Power Systems capital expenditure on IT projects such as project management, geographical information systems, and system control.

Connection Charges

- 2.42 Connection charges are set to reflect the costs of new connections to the transmission system. The costs related to new connection assets are charged directly to the customer, either as a one-off payment, or over the lifetime of a connection agreement. For convenience, the income has been shown to reflect a one-off payment of the capital charge. Operation and maintenance charges would also be payable, again either as a capitalised sum, or over the connection agreement period.

Summary

- 2.43 Scottish Hydro-Electric operates in a unique territory with 2 per cent of the UK population in an authorised area of 25 per cent of the UK landmass. In Scottish Hydro-Electric's view, this has an inevitable impact on the ability of the company to continue to achieve high levels of efficiency improvements.
- 2.44 It is possible that system reinforcement requirements will increase significantly over the next five years due to new generation (eg SRO, CHP schemes), a marked increase in load growth, the franchise break (eg, losing control of time switch regimes following entry of new suppliers) and the effects of the Scottish Trading Arrangements presently under discussion.
- 2.45 Scottish Hydro-Electric is concerned that the opportunity to re-open the price control debate must be retained should the impact of these issues increase significantly.

TABLE 2A : HYDRO-ELECTRIC HCA OPERATING COSTS FOR TRANSMISSION BUSINESS – IN NOMINAL PRICES

Description	Actual				Forecast							
	1994/95 £m	1995/96 £m	1996/97 £m	1997/98 £m	1998/99 £m	2004/05 £m	1999/00 £m	2000/01 £m	2001/02 £m	2002/03 £m	2003/04 £m	
Exit charges												
Rates on transmission system	3.2	3.3	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.9	
Depreciation on transmission system	3.3	4.0	4.3	4.4	4.2	5.5	6.1	7.3	7.8	8.1	7.9	
Payroll costs	4.1	3.8	3.1	3.6	3.2	2.8	2.7	2.7	2.7	2.7	2.7	
Non payroll IT costs	0.6	0.4	0.9	0.9	1.1	0.7	0.6	0.6	0.6	0.6	0.6	
Premises costs	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.6	
Insurance	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.8	
Materials	2.0	1.9	1.4	1.2	0.8	0.8	0.7	0.7	0.7	0.7	0.7	
Other	12.0	11.8	11.3	14.3	15.0	17.5	19.3	21.2	21.8	22.2	22.6	
Total costs	26.4	26.4	25.5	29.0	29.1	32.3	34.7	38.0	39.3	40.4	40.8	

As submitted to OFFER by the company.

TABLE 2B: HYDRO-ELECTRIC HCA OPERATING COSTS FOR TRANSMISSION BUSINESS – IN 1997/98 PRICES

Description	Actual				Forecast					
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
Exit charges	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rates on transmission system	3.5	3.5	3.4	3.4	3.5	3.6	3.7	3.7	3.8	3.9
Depreciation on transmission system	3.6	4.2	4.4	4.4	4.1	5.2	5.6	6.5	6.7	6.8
Payroll costs	4.5	4.0	3.2	3.6	3.1	2.6	2.5	2.4	2.3	2.3
Non payroll IT costs	0.7	0.4	0.9	0.9	1.1	0.7	0.5	0.5	0.5	0.5
Premises costs	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7
Insurance	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Materials	2.2	2.0	1.4	1.2	0.8	0.8	0.6	0.6	0.6	0.6
Other	13.1	12.5	11.7	14.3	14.6	16.5	17.7	18.8	18.8	18.6
Total costs	28.8	27.9	26.3	29.0	28.3	30.4	31.7	33.8	33.9	33.8

As submitted to OFFER by the company.

TABLE 2C : HYDRO-ELECTRIC CAPITAL EXPENDITURE FOR TRANSMISSION BUSINESS – IN NOMINAL PRICES

Description	Actual				Forecast						
	1994/95 £m	1995/96 £m	1996/97 £m	1997/98 £m	1998/99 £m	1999/00 £m	2000/01 £m	2001/02 £m	2002/03 £m	2003/04 £m	
Capital expenditure - load related	1.3	2.5	3.8	1.2	4.1	13.1	14.2	5.9	8.2	9.3	6.4
- non load related	6.0	6.7	7.9	10.8	11.3	10.9	11.7	10.7	11.1	10.7	11.0
- non operational	8.4	0.9	1.5	2.2	1.4	1.6	1.5	1.9	1.5	1.7	2.1
- customer contributions					-1.0	-10.6	-4.5	-2.6	-5.6	-5.7	-2.8
Total costs	15.7	10.0	13.3	14.2	15.7	15.0	22.9	15.9	15.2	16.0	16.7

Year to March 1995 includes £7.2m of Telecoms additions.

As submitted to OFFER by the company.

TABLE 2D : HYDRO-ELECTRIC CAPITAL EXPENDITURE FOR TRANSMISSION BUSINESS – IN 1997/98 PRICES

Description	Actual				Forecast						
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	
Capital expenditure - load related	1.5	2.6	3.9	1.2	3.9	12.3	13.0	5.2	7.0	7.8	5.2
- non load related	6.6	7.1	8.2	10.8	10.9	10.3	10.7	9.5	9.6	9.0	8.9
- non operational	9.1	0.9	1.5	2.2	1.4	1.5	1.4	1.7	1.3	1.4	1.7
- customer contributions	0.0	0.0	0.0	0.0	-1.0	-10.0	-4.1	-2.3	-4.8	-4.8	-2.3
Net Capital Expenditure	17.2	10.6	13.7	14.2	15.3	14.2	21.0	14.1	13.1	13.4	13.5

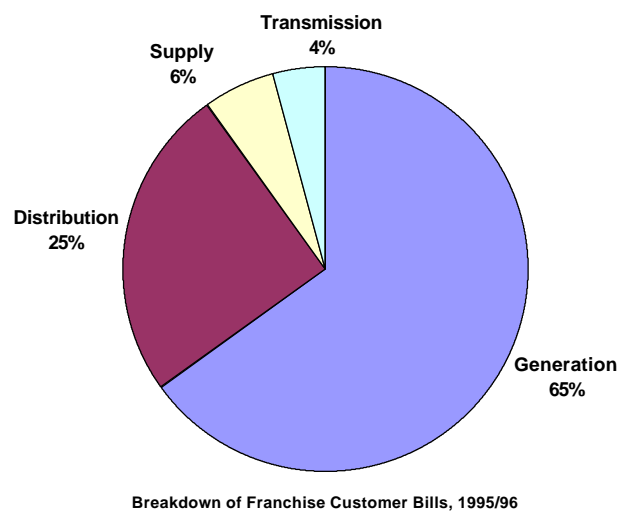
As submitted to OFFER by the company.

3. SCOTTISHPOWER'S NARRATIVE

Introduction

3.1 The ScottishPower Transmission business operates a network of high voltage lines which carry power from generating stations to the local distribution networks. These lines operate at voltages of 132, 275 and 400 kV. Transmission systems transport large amounts of energy and are normally designed to continue to provide supply in the event of single or even multiple circuit failures. The number of incidents that result in a loss of supply to final customers is extremely small.

3.2 All customers contribute towards the cost of transporting power through the transmission network. However, for the vast majority of customers, transmission charges represent only a small proportion of the overall bill. The chart opposite shows that in 1995/96 (the latest publicly available data) transmission charges to the Scottish franchise (<100 kW) market were around 4 per cent of total electricity charges.



3.3 Even with the relatively small impact on final customers' prices, a secure and efficient transmission network is a prerequisite for the delivery of a high quality electricity supply to all customers.

Review of the Present Price Control Period

3.4 In September 1993 OFFER's Proposals for the Scottish Transmission Price Controls stated that "there is less scope for cost and price reduction by the Scottish companies." In ScottishPower's view, this has turned out to be the case.

3.5 The calculation made by OFFER to set the present price control included forecasts of costs and investment over the period. By updating these calculations with actual costs and investment the performance of the price-controlled part of the business has been derived. This updated analysis shows that even with the incentive properties of RPI-X regulation and the progressive management initiatives adopted, the rate of return earned by the price-controlled part of the Transmission business will fall short of the regulator's assumed cost of capital.

- 3.6 ScottishPower also considers that the true cost of capital to the Transmission business has been higher over the existing price control than six per cent (pre-tax, real). Some recent price control reviews of regulated businesses concluded that seven per cent was appropriate. ScottishPower considers even that level of return does not take into account changes to the tax regime nor the cash flow implications of the windfall tax.
- 3.7 During the present price control period Transmission has reduced controllable operating costs, delivered a significant system investment programme and improved the system performance which was already at a high level.
- 3.8 Specifically, Transmission has:
- delivered a capital investment spend programme in line with OFFER's price control assumptions and realised increased outputs through procurement efficiencies;
 - reduced controllable operating costs by 14 per cent in real terms over the period;
 - provided world-class transmission network performance and supply quality;
 - achieved productivity improvements through the integration with Distribution;
 - completed the 1600 MW upgrade of the English-Scottish Interconnector; and
 - introduced an asset management programme to direct infrastructure investment to where it is most needed.

Operating Costs

- 3.9 This section explains the levels and trends in transmission operating costs contained in [Table 3A \(Page 36\)](#). The same information is presented in [Table 3B \(Page 37\)](#) in 1997/98 prices.
- 3.10 Over the present period the business has worked hard to deliver further cost savings whilst maintaining world-class performance standards.
- 3.11 The controllable operating costs have reduced by 14 per cent (£4 million) in real terms over the regulatory period as a result of a focused and co-ordinated drive to improve efficiency and productivity.

3.12 Operating costs were recognised by OFFER as being at an efficient level in 1993, and have since reduced. ScottishPower considers Transmission to be a mature business, for which opportunities of cost reductions have become very difficult to identify. In the regulated area of the business only 42 per cent of the total operating costs come under the direct control of management.

3.13 Transmission will continue to focus on being an efficient, low-cost operator. However, a number of external factors may increase the costs of the business in future:

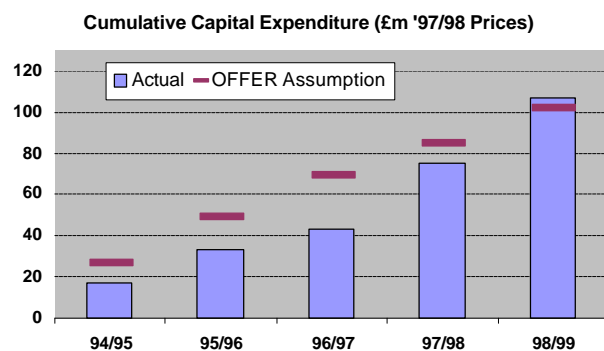
- enhanced environmental obligations;
- rates revaluation in 2000;
- 1998 system costs;
- increased costs associated with new safety legislation; and
- more onerous customer expectations.

3.14 Depreciation charges are also expected to increase as a consequence of future and past investment on network modernisation and network control. These investments are aimed at meeting the requirements of system planning standards and both maintaining and improving the service to customers, in line with their expectations.

Capital Investment

3.15 This section explains the levels and trends in ScottishPower's proposed transmission capital investment contained in [Table 3C \(Page 38\)](#). The same information is presented in [Table 3D \(Page 39\)](#) in 1997/98 prices.

3.16 Over the present price control period the actual investment in the regulated portion of the transmission system is expected to be broadly in line with that assumed within the price control. This has been achieved simultaneously with efficiency improvements in the capital programme while maintaining standards of system performance and supply quality at world-class levels. Cumulative system expenditure is shown opposite.



3.17 No provision for load related expenditure was made for capital expenditure for the review. In comparison, Scotland has seen a sizeable increase in GDP over the period and considerable growth in the electrical and electronic sector where output increased by 21.3 per cent in 1997 alone, requiring unanticipated infrastructure reinforcement.

3.18 Initiatives to improve capital efficiency have been successfully implemented:

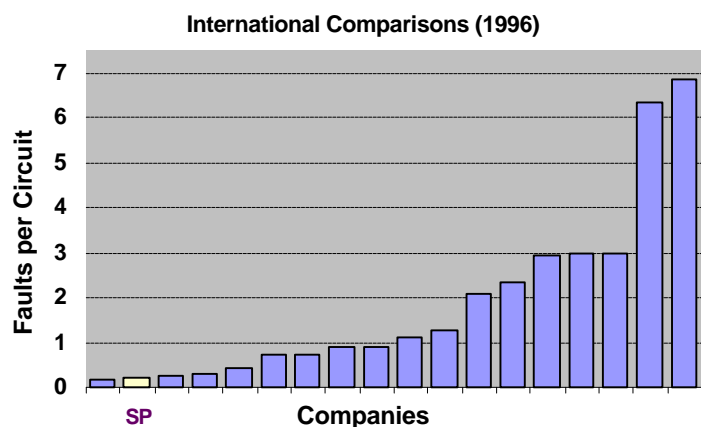
- system reconfiguration and asset modernisation plans have been carefully co-ordinated and optimised;
- plant designs have been improved through the use of functional specifications and design and build contracts have allowed contractors to use their expertise for competitive advantage;
- procurement strategies have been prepared for all major projects delivering real cost savings over the period;
- condition monitoring improvements have extended asset lives;
- increased benefits have been realised through the application of new technology; and
- improved project management practices have reduced costs.

3.19 Transmission will continue to fund sufficient levels of capital expenditure to maintain system performance and supply quality and to ensure the safety of the staff and the public. In the next period, ScottishPower argue that the Dumfries and Galloway system will require to be reinforced and an extensive programme of refurbishment and replacement will be carried out. Under-utilised plant will be relocated to maximise use of assets.

3.20 ScottishPower's present programme to improve supply quality will be extended over the next control period to reduce voltage dips by minimising system faults and by monitoring plant condition to provide advance warning of plant failure.

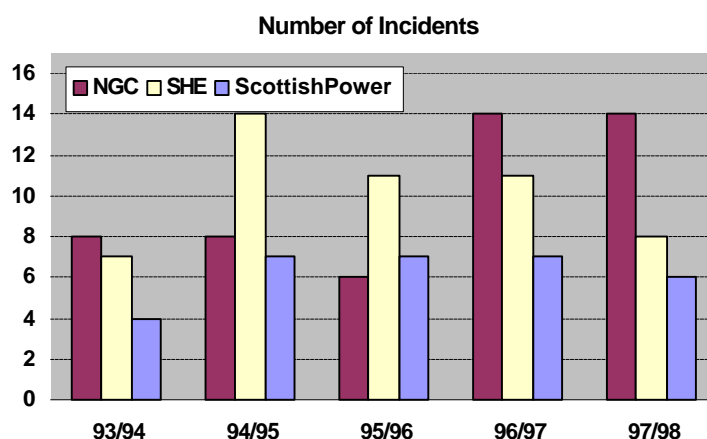
Transmission System Performance

3.21 ScottishPower consider their transmission system performance to be at high quality. A recent benchmarking exercise compared the Transmission business with others around the world, the results of which confirmed it to



be an upper quartile performer in many areas. A key measure of network performance is the number of faults experienced per circuit and this indicator showed ScottishPower to be second out of the eighteen companies that participated.

3.22 Further evidence is provided in OFFER's transmission system performance report. ScottishPower was confirmed to have the smallest number of incidents¹ of the three systems in Great Britain in the most recent year reported.



3.23 However, some concerns have been expressed by customers relating to the consequences of voltage dips. Voltage dips happen on all power systems because of system faults, for example, lightning strikes and cable faults. Because of the interconnected nature of the grid, they can affect a large number of customers. During recent years ScottishPower has successfully demonstrated the benefits which can be derived from increased electronic monitoring of the system. This has enabled the identification of incipient plant defects prior to the development of a system fault. Using ScottishPower's fault locator system it has also been possible to identify those sections of overhead line which are more prone to weather related disturbances.

3.24 Further investment is planned to extend system monitoring and to target specific assets to reduce system faults. The effectiveness of investment to avoid damage to primary plant and to reduce fault rates on overhead lines during severe weather has been demonstrated. The success of ScottishPower's fault locator pilot project will allow us to extend that capability to all lines and give early indications of weaknesses where repeated faults are occurring. Investment will then be made to modify troublesome lines to reduce the number of system faults and their consequential effect on customers.

Interconnectors

3.25 Recognising that unsatisfied demand for export capacity exists, and that further new generation developments in Scotland are likely to add to this demand, ScottishPower has already instigated discussions with NGC and Scottish Hydro-Electric to establish the feasibility of a further capacity upgrade to 2500 MW.

¹ A system event that results in a loss of supply to customers

- 3.26 ScottishPower and Scottish Hydro-Electric have therefore submitted an application to the NGC Interconnection Business under the British Grid System Agreement (BGSA) to upgrade the English-Scottish Interconnector capacity by 300 MW.
- 3.27 This proposal is presently being studied by the BGSA's Joint Interconnector Planning Group and a report addressing alternative ways of achieving the proposed upgrade and associated costs is due to be issued by February 1999. The report will be submitted to the BGSA committee following which NGC will have one month to respond to the Scottish companies.

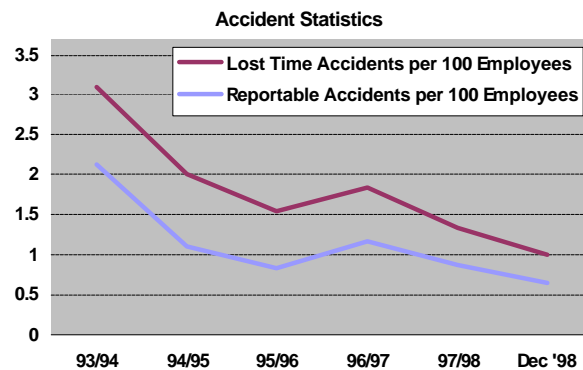
Environmental Planning and Land Management Issues

- 3.28 ScottishPower will meet or improve upon legislative and regulatory environmental requirements and codes of practice. This involves the preparation of a large number of environmental reports, public inquiries and lengthy consultation exercises in pursuit of consents. Examples are:
- infrastructure developments in Fife and Inverclyde;
 - NEC, Braehead Retail Park and Hyundai; and
 - the interconnector links to Northern Ireland and England.
- 3.29 Public consultation and the preparation of environmental statements are becoming more time-consuming and expensive. It can take up to several years to secure the necessary planning permission to permit construction to proceed.
- 3.30 An example of such environmental difficulties arose from the location of Dewar Place 275 kV substation in Edinburgh's city centre which became very difficult to retain with the development of Exchange Plaza financial centre. However, a modest investment completely transformed the existing substation by the use of landscaping, colour and lighting. This was a highly cost-effective solution and avoided a major and expensive system reconfiguration.
- 3.31 Similarly, a primary feature of environmental care over the period has been the Company's investment in oil containment and separation schemes at existing substations close to major watercourses. This is a rolling programme and includes both retro-fitting substations and making new provisions when substations come up for general refurbishment.

Safety

3.32 The combined Transmission and Distribution businesses continue to demonstrate a high level of commitment to safety.

3.33 A safety campaign which started in 1993 has helped to reduce lost time and reportable accidents per 100 employees to an all time low of 1 lost time accident per 100 employees. The long-term trend is downwards with only a slight upturn when Manweb figures were combined with ScottishPower's figures in 1996/97.



3.34 ScottishPower's drive to reduce accidents to the lowest level possible will continue into the future with new safety initiatives being led by senior management. ScottishPower's future strategy includes:

- increasing the focus on public, employee and contractor safety;
- the introduction of initiatives to improve public safety in respect of accidental or intentional interference with company equipment; and
- ensuring that members of the public and children in particular are aware of the dangers associated with electricity.

3.35 Through school curriculum and community safety initiatives ScottishPower is educating people on the safe use of electricity.

Conclusions

3.36 Transmission costs have a relatively small impact on final customers' prices, but a secure and efficient transmission network is a prerequisite for the delivery of a high quality electricity supply to all customers.

3.37 Although ScottishPower state that they will continue to deliver some productivity improvements in many areas, principally through sharing economies of scale with the Distribution business, they consider that these will not be large.

3.38 External cost drivers such as new safety legislation, new environmental obligations, higher rates and increased customer expectations, will lead to future increases in operating costs.

- 3.39 Capital investment in the present period has been consistent with OFFER's price control assumption.
- 3.40 Future capital expenditure will continue to direct infrastructure investment to where it is most needed by optimisation of the asset management programme.
- 3.41 System performance and supply quality is recognised as world class through benchmarking.

TABLE 3A : SCOTTISHPOWER HCA OPERATING COSTS FOR TRANSMISSION BUSINESS – IN NOMINAL PRICES

Description	Actual					Forecast				
	1994/95 £m	1995/96 £m	1996/97 £m	1997/98 £m	1998/99 £m	1999/00 £m	2000/01 £m	2001/02 £m	2002/03 £m	2003/04 £m
Exit charges										
Rates on transmission system	10.4	10.1	10.6	10.9	11.2	11.6	14.9	16.9	17.4	18.0
Depreciation on transmission system	9.1	9.7	10.3	10.7	11.8	12.9	14.1	15.4	16.8	18.1
Payroll costs	5.8	5.2	6.3	4.7	6.2	6.3	6.4	6.6	6.8	7.0
Non payroll IT costs	0.6	0.6	0.3	0.6	1.1	1.1	1.2	1.2	1.3	1.3
Premises costs			0.3	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Insurance	0.5	0.9	1.0	1.0	1.2	1.2	1.3	1.3	1.4	1.4
Materials etc.	26.7	23.3	19.7	21.1	22.1	23.6	23.8	27.9	28.4	29.3
Other										
Total costs	53.1	49.8	48.5	49.5	54.1	57.2	62.2	69.9	72.7	75.7
										78.9

As submitted to OFFER by the company.

TABLE 3B : SCOTTISHPOWER HCA OPERATING COSTS FOR TRANSMISSION BUSINESS – IN NOMINAL PRICES

Description	Actual				Forecast					
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
Exit charges	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rates on transmission system	11.4	10.7	10.9	10.9	10.9	10.9	13.6	15.0	15.0	15.1
Depreciation on transmission system	9.9	10.3	10.6	10.7	11.5	12.2	12.9	13.7	14.5	15.2
Payroll costs	6.3	5.5	6.5	4.7	6.0	5.9	5.9	5.9	5.9	5.9
Non payroll IT costs	0.7	0.6	0.3	0.6	1.1	1.0	1.1	1.1	1.1	1.1
Premises costs	0.0	0.0	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Insurance	0.5	1.0	1.0	1.0	1.2	1.1	1.2	1.2	1.2	1.2
Materials etc.	29.2	24.7	20.3	21.1	21.5	22.2	21.8	24.8	24.5	24.5
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total costs	58.0	52.7	50.1	49.5	52.5	53.9	56.9	62.1	62.7	63.4
										64.1

As submitted to OFFER by the company.

TABLE 3C : SCOTTISHPOWER CAPITAL EXPENDITURE FOR TRANSMISSION BUSINESS – IN NOMINAL PRICES

Description	Actual				Forecast								
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
Capital expenditure - load related	0.5	7.3	13.8	9.2	6.1	13.0	30.4	44.2	17.2	16.1	4.9		
- non load related	15.4	14.6	8.7	27.4	28.9	29.5	31.1	29.3	30.2	39.2	41.7		
- non operational	0.2	0.8	0.9	0.5	2.3	1.0	0.8	0.8	0.7	0.7	0.9		
- customer contributions	(0.5)	(0.8)	(0.9)	(1.3)	(2.2)	(1.6)	(1.2)	(17.2)	(0.1)	(2.2)	0.0		
Net Capital Expenditure	15.6	21.9	22.5	35.8	35.1	41.9	61.1	57.1	48.0	53.8	47.5		

As submitted to OFFER by the company.

TABLE 3D : SCOTTISHPOWER CAPITAL EXPENDITURE FOR TRANSMISSION BUSINESS – IN 1997/98 PRICES

Description	Actual				Forecast								
	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
Capital expenditure - load related	0.5	7.7	14.3	9.2	5.9	12.3	27.8	39.3	14.8	13.5	4.0		
- non load related	16.8	15.4	9.0	27.4	28.1	27.8	28.5	26.0	26.0	32.8	33.9		
- non operational	0.2	0.8	0.9	0.5	2.2	0.9	0.7	0.7	0.6	0.6	0.7		
- customer contributions	(0.5)	(0.8)	(0.9)	(1.3)	(2.1)	(1.5)	(1.1)	(15.3)	(0.1)	(1.8)	0.0		
Net Capital Expenditure	17.0	23.2	23.2	35.8	34.1	39.5	55.9	50.7	41.4	45.0	38.6		

As submitted to OFFER by the company.