

Costs and Performance Report 2001-02

East of Scotland Water Authority
North of Scotland Water Authority
West of Scotland Water Authority

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Foreword

This is the first annual *Costs and Performance Report*. It examines the financial performance of the three Scottish water authorities in the final year before they were merged into Scottish Water (that is, 2001-02).

I also intend to publish two further annual reports on the investment and asset management of the Scottish water industry, and on the levels of service provided to customers.

This annual *Costs and Performance Report* acts, in short, as a 'report card' on the value for money provided by the industry in Scotland. It provides objective information on the financial performance of the Scottish water industry, both in absolute and relative terms, by considering the following questions.

- How the levels of service provided and the costs incurred by the industry in Scotland compare with those of the water industry in England and Wales.
- How performance in Scotland and in England and Wales changed over the previous year, and the extent of any improvements in efficiency.

It is important to highlight that an efficiency is not simply a cut in costs. An efficiency is achieved only when an improved, or at least maintained, level of service to customers is provided for lower cost.

It is important for customers to be confident that our comparisons are objective and fair. In assessing the relative performance of the industry in Scotland, therefore, we have taken into account factors such as rurality, the characteristics of customers supplied, the condition and performance of the asset base and the level of environmental and public health compliance.

Overall, the industry's performance in 2001-02 presents a mixed picture, and it improved less than had been expected at the time of my *Strategic Review of Charges*.

- All three authorities appear to have made progress in improving their procurement of capital projects.
- With regard to the level of operating cost efficiency, the West of Scotland Water Authority improved, but the performance of both the East of Scotland Water Authority and North of Scotland Water Authority deteriorated.
- In terms of both capital expenditure and operational cost efficiency, each authority lagged considerably behind all of the companies in England and Wales.
- During the year, there was no material improvement in the relative performance of the industry in Scotland when compared with the industry south of the border.

Given the potential for economies of scale, the lack of improvement would clearly seem to justify Parliament's decision to create Scottish Water.

In my *Strategic Review of Charges*, I advised Scottish Ministers on the revenue that the water industry in Scotland needed from customers to ensure that we would all enjoy a financially and environmentally sustainable service. This advice assumed that the industry would make significant improvements in its efficiency. Failure to achieve these improvements could result in one or more of the following undesirable outcomes:

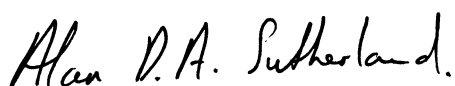
- higher prices;
- lower levels of customer service;
- lower levels of compliance with environmental or public health targets than had been agreed;
- a greater burden on public expenditure.

Scottish Water is tasked with reducing costs by just over £380 million annually by 2005-06. If Scottish Water were to fall short in achieving this, even by 10%, or £38 million, the average domestic bill would have to increase by over £10 a year. It is, therefore, clearly in customers' interests that Scottish Water makes swift progress in improving its performance and in reducing costs.

The role of regulation is to ensure that the interests of customers are safeguarded and that customers receive greater value for money. I will give credit when the industry delivers the improvements in value for money that the customer has the right to expect. However, I will also ensure that shortfalls in performance are immediately highlighted. To this end, I intend that my office will continue to adopt a rigorous and challenging approach to the performance of the industry.

I believe that this annual report will help customers to understand how the industry in Scotland compares with that in England and Wales. I also hope that these annual reports will help those who manage the water industry in Scotland to focus on achieving the challenging targets agreed in the *Strategic Review of Charges*.

All of us, as customers, have the right to expect that the challenges outlined in that Review are met and that value for money provided to customers in Scotland will approach the levels delivered south of the border.



Alan D A Sutherland

Water Industry Commissioner for Scotland
February 2003

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Executive summary

Introduction

The *Strategic Review of Charges*, published in November 2001, set challenging but achievable efficiency targets for the water industry in Scotland for the period 2002-06. This report focuses on the performance of the three Scottish water authorities during the 2001-02 financial year. This was the last year before they were merged to become Scottish Water in April 2002.

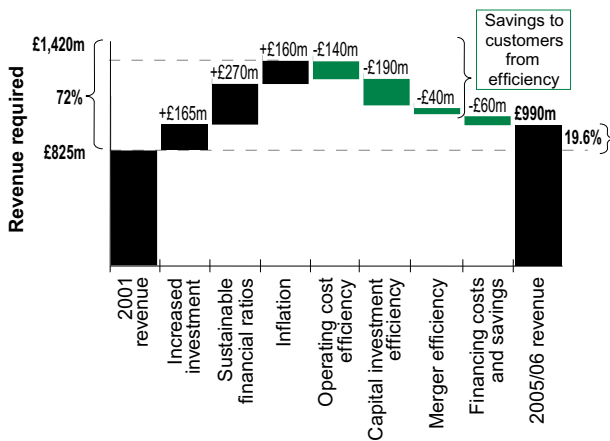
The performance of the three authorities in this year represents the platform for further progress that Scottish Water will be required to make by 2005-06. In the medium to long term, the outlook for water and sewerage prices will depend on the progress that the water industry in Scotland makes to narrow the efficiency gap with England and Wales.

operating cost efficiency of the industry in Scotland compared to the water and sewerage companies in England and Wales.

Both of these benchmarking methods take full account of the information provided in regulatory returns. As such, they ensure that comparisons are objective and fair. These benchmarking techniques also allow comparisons of the rate of progress in improving efficiency in Scotland and south of the border. The first of these techniques builds upon the econometric models developed by the Office of Water Services (Ofwat). The second technique was developed by this office, the Water Industry Commissioner for Scotland (WICS).

We also use a benchmarking of standardised costs of capital projects to assess efficiency in the procurement of investment.

Figure 1: The outlook for water and sewerage prices in Scotland



The performance of the three authorities in 2001-02 showed mixed progress compared with the water industry in England and Wales, and a shortfall when compared with the efficiency targets set in the Strategic Review. The efficiency gap with England and Wales remains very significant.

Performance 1996-2002

We used the benchmarking techniques described above to review the efficiency performance of the industry in Scotland. The results are shown in Figure 2.

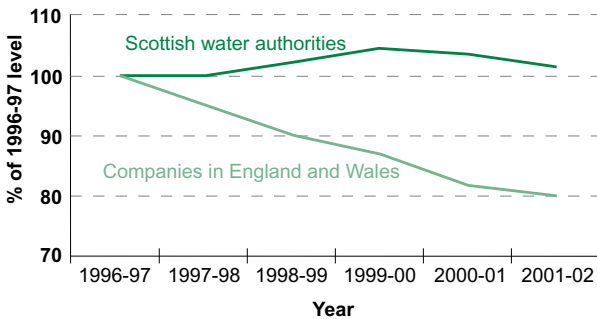
The companies in England and Wales reduced operating costs to around 80% of the 1996-97 levels, on a like-for-like basis¹. In Scotland, costs have increased modestly and are now about 5% higher than 1996-97 levels. The performance of the Scottish industry has, however, marginally improved, on an absolute basis, over the last two years. Relative to the English and Welsh industry, there has been a marked deterioration in the financial performance of the industry in Scotland in the period since 1996.

It is important to define what we mean by efficiency throughout this report. Efficiencies require the same or a better level of service to be delivered at lower cost.

We collect detailed information from the water service provider on assets, on the customer base and other factors that influence cost. Two separate methods of benchmarking are then used to determine the relative

1. Adjusted for inflation and for the additional costs of water and sewage treatment imposed on the authorities to meet modern standards.

Figure 2: Trends in base operating costs



Performance 2001-02

The operating cost performance of the three authorities in the year preceding the merger into Scottish Water was quite mixed. West of Scotland Water Authority improved by 8%. In contrast the operating cost performance of both East of Scotland Water Authority and North of Scotland Water Authority deteriorated by 3% and 5% respectively.

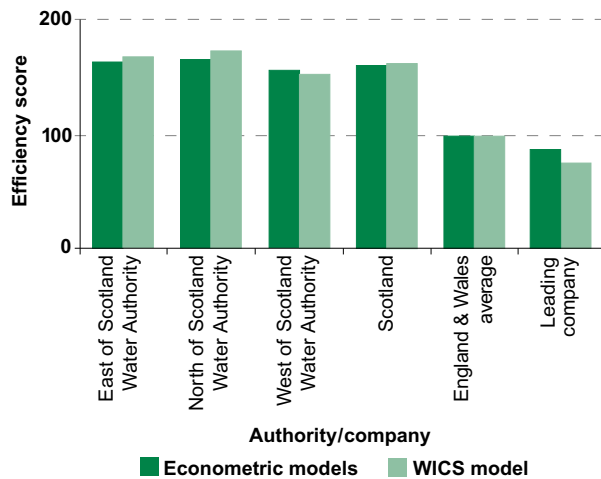
Moreover, there are quite significant differences between the levels of efficiency achieved by the companies in England and Wales. The leading company, for example, is over 10% better than the average.

Figure 3 (opposite) and Figure 4 (overleaf) outline the results of the detailed benchmarking of the performance of each of the three authorities in terms of relative operating cost efficiency and relative capital efficiency. In each case there is a very significant difference between even the average English company and the best performing authority. These efficiency scores represent the cost of delivering an exactly equivalent service.

With regard to operating expenditure (Figure 3), the three authorities incurred costs that were around double those of the leading water companies, on a like-for-like basis. The results were similar using both of the benchmarking techniques noted above.

The benchmarking results are calibrated such that average performance is 100. The leading company has a score of 88. This is equivalent to saying that the leading company requires only £88 for every £100 required by an average company to meet its operational costs.

Figure 3: Relative operating efficiency scores



It is important in reviewing these efficiency scores to note again that they compare costs for delivering an exactly equivalent service. Since this is demonstrably not the case in Scotland, a true picture of relative efficiency requires the cost to an efficient company of the different scope and level of service to be considered. These differences include better compliance with water quality targets, addressing leakage and the level of services to customers. These results are shown in Tables 1 and 2.

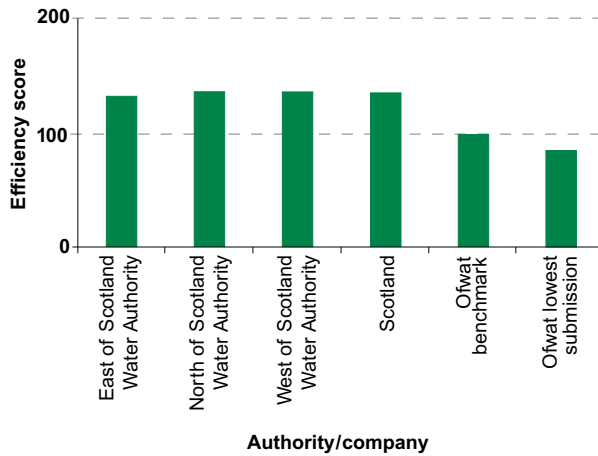
Table 1: Efficiency scores taking account of differences in scope and customer service

Authority/company	Econometric models	Alternative model
East of Scotland Water Authority	194	199
North of Scotland Water Authority	197	206
West of Scotland Water Authority	185	181
Scotland	191	194
England & Wales average	100	100

Table 2: Costs of inefficiency in operating costs taking account of differences in scope and customer service

Authority/company	Cost
East of Scotland Water Authority	£1.99
North of Scotland Water Authority	£2.06
West of Scotland Water Authority	£1.81
Scotland	£1.94
Leading England & Wales company	£0.76

Figure 4: Relative capital efficiency scores



The performance of the Scottish authorities in delivering their capital investment is better. Their capital costs are around 60% higher than best practice for the companies in England and Wales.

When measuring capital efficiency, the following factors need to be taken into account:

- **Strategic asset management** - 'saving by not doing'. The decision not to spend should, however, only be considered as an efficiency if this is done without compromising output and performance measures both now and in the future.
- **Programme planning or investment appraisal** - 'doing it better'. This area of analysis considers whether projects deliver their objectives in the most cost-effective way.

- **Procurement** - 'buying it smarter'.
- **Innovation** - 'doing it the new way'. This analysis assesses the scope for innovation efficiency by comparing the impact of low-cost technologies with current practice.

Only procurement can easily and objectively be measured on an annual basis. As procurement was by some distance the largest single element of the capital efficiency gap, it is possible to assess how the industry in Scotland is performing in delivering its capital programme.

It is encouraging that all three authorities made progress on capital efficiency, as measured by procurement costs. These fell in 2001-02 by 6%-8% in real terms. Whilst this is undoubtedly a useful improvement, it is noteworthy that the English and Welsh companies also continued to improve their procurement. The average improvement in England and Wales in 2001-02 was around 5% in real terms.

There is also some evidence from responses to regulatory letters that the three authorities did not complete all of the investment planned for the 2000-02 period. This would obviously have an adverse impact on the overall capital efficiency of the industry in Scotland.

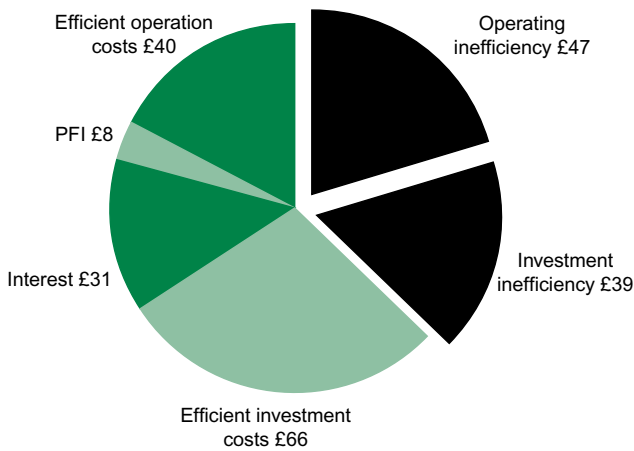
The impact on bills

Unfortunately the impact of the efficiency gap on customers' bills in Scotland is very significant. Bills in 2001-02 were 60% higher than would have been the case were the authorities operating as efficiently as the companies in England and Wales.

Figure 5 illustrates the impact of inefficiency on the average household bill. It shows that the average domestic customer faces a bill some £86 per year higher than should be necessary, because of the poor performance of the industry in Scotland.

Figure 5: The impact of inefficiency on domestic customers' average bill in 2001-02

Average domestic bill = £231



The targets set at the Strategic Review were such that 80% of the assessed efficiency gap with the companies south of the border would be closed. Consequently, even if Scottish Water achieves these targets in full, the efficiency gap will remain and customers will still be paying more than they would to a fully efficient company.

If the English and Welsh companies do not make efficiencies that go beyond those set by the regulator, and Scottish Water achieves its efficiency targets in full, the impact of the efficiency gap on average domestic bills in Scotland by 2005-06 will still be around £54. Moreover, evidence from England and Wales suggests that the companies are continuing to improve at least in line with the demands of their regulator, Ofwat. It is therefore likely that we will seek to set further significant efficiency targets to address this at the time of the next Strategic Review of Charges.

Chapter 1

Introduction

This is the first annual *Costs and Performance Report*. In the *Strategic Review of Charges*, we recommended to Scottish Ministers that we should publish three annual reports on progress in the Scottish water industry. These were:

- a costs and performance report;
- a report on the investment and asset management of the industry; and
- a report on the level of service provided to customers.

The *Costs and Performance Report* seeks to compare the value for money provided by the water industry in Scotland with that delivered in England and Wales. The report also seeks to compare the rate of improvement in the value for money provided to customers.

This first *Costs and Performance Report* covers the financial year 2001-02. It therefore relates to the final year of operation for the three regional water authorities: East of Scotland Water Authority, North of Scotland Water Authority, and West of Scotland Water Authority. The report covers both operating costs and capital expenditure.

The report contains seven chapters. Chapter 2 outlines the *Strategic Review of Charges* process and describes the analysis of costs and performance. Chapter 3 sets out the results of the detailed benchmarking of the operating costs performance of the water industry in Scotland and in England and Wales. Chapter 4 outlines the improvement achieved in capital expenditure efficiency over the past year. Chapter 5 puts the efficiency targets in perspective and explains why these are important to customers. Chapter 6 describes the on-going monitoring of performance that we undertake. This is followed by a short concluding chapter.

Chapter 2

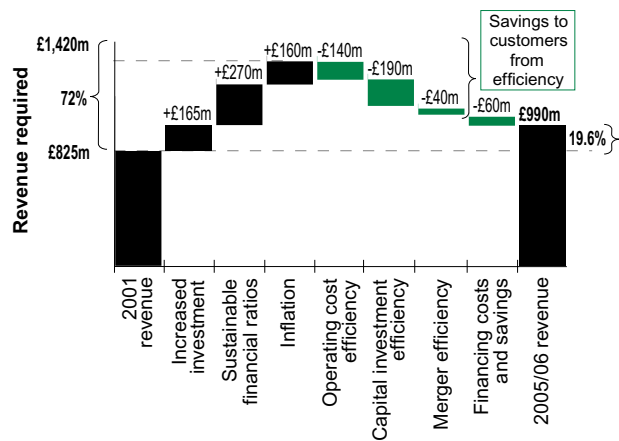
The Strategic Review of Charges 2002-06

The *Strategic Review of Charges*, published in November 2001, provided advice to Scottish Ministers on appropriate revenue caps for Scottish Water for the period April 2002 to March 2006. These revenue caps, which Scottish Ministers accepted, determined the revenue that could be raised through charges to customers. This advice took account of all relevant factors, including:

- the operating expenditure efficiencies that are required to be achieved;
- the capital expenditure efficiencies that are required to be achieved;
- the rate of change that should be expected and the costs of achieving that change;
- the level of service to be provided to customers; and
- the capital investment required to ensure that all public health and environmental improvement targets were met and to ensure that there was no further deterioration in the level of service provided to customers.

The operating cost and capital expenditure efficiency targets are critical to the long-term success of Scottish Water and have the effect of reducing the amount of revenue that the authority requires in order to carry out its functions. Figure 2.1 demonstrates the importance of the efficiency targets.

Figure 2.1: The composition of the Scottish Water revenue cap



In summary, bills would have had to be increased to even higher levels, had this scope for efficiency not existed.

The targets for operating cost reduction were explained in detail to the senior management of the three authorities during the late summer and autumn of 2000. Capital efficiency targets were explained in May 2001. The targets were communicated ahead of the publication of the Strategic Review in order to allow the management time to begin the process of reducing costs. At that time we emphasised that establishing early momentum would be crucial if there was to be any significant narrowing of the efficiency gap with England and Wales.

The Strategic Review assumed (and management of the three authorities accepted) that some progress could be made in reducing operating costs during the year prior to the 2002-06 review period. Since the capital efficiency targets were not finalised until the 2001-02 financial year had begun, no capital efficiency targets were assumed for that year. This report focuses on the 2001-02 financial year and assesses the actual performance of the three authorities during that year. The actual performance is compared with the assumptions made at the Strategic Review.

Before outlining the industry's performance in detail, it is important to understand exactly what we mean by an efficiency and the context of the efficiency targets that were set in the Review.

2.1 Efficiency

We use the same definition of efficiency as other industry regulators in the UK. This is that an efficiency can only be claimed when *at least* the same output and level of service is delivered for less money. In other words, simply cutting costs is not an efficiency, nor is a change in accounting policy that results in lower declared expenditure. Similarly, the delay of a necessary capital project from the current to a future regulatory period is also not an efficiency.

2.2 Assessing relative efficiency through benchmarking

Our role is to promote the interests of the customers of the core water and sewerage business in Scotland. This includes ensuring that the authorities deliver the required outputs, such as agreed environmental standards, water quality compliance and continuity of service to customers at as low a cost as possible. Our benchmarking analysis reveals the extent to which costs are incurred by the authorities over and above those necessary to deliver an efficient service. The result of inefficiency is, of course, higher bills for customers.

We sought to take into account the potential for efficiency in the revenue caps in our advice to Scottish Ministers. These targets are challenging but achievable.

In England and Wales, Ofwat publishes an annual report on efficiency and unit costs. Exposing the relative performance of the various regional companies in England and Wales to direct and objective comparison, demonstrates to customers, managers, and owners the degree of improvement required to achieve leading status. This has introduced a powerful dynamic as the companies have tried to outperform one another.

There is some evidence that this comparative competition has worked in Scotland. For example, each Code of Practice for customer service issued by one of the three authorities has strived to be better and more innovative than the existing Codes of the other two authorities.

It is therefore to be hoped that clear, objective and public annual comparison of performance in Scotland with that in England and Wales should introduce a significant incentive for Scottish Water to improve.

We use three benchmarking techniques to assess the relative efficiency of the Scottish water authorities.

These are:²

Operating cost	Econometric models developed by Ofwat
	Specially developed WICS model
Capital cost	Ofwat's Cost Base Approach

Ofwat's principal analytical tool for assessing relative operating efficiency is econometric modelling. The models were originally developed by Ofwat and Professor Mark Stewart of Warwick Business School in the early 1990s. They were used for Ofwat's 1994 and 1999 price reviews. The models are updated and published at regular intervals.

Ofwat's approach to assessing relative operating efficiency, and the econometric models themselves, were endorsed in 2000 by the Competition Commission, following a detailed review. This followed an appeal by two small water only companies, Mid Kent Water and Sutton & East Surrey Water, to Ofwat's 1999 price determination.

In January 2000, Ofwat's approach earned wide endorsement as an example of best practice from the Performance and Innovation Unit of the UK Government Cabinet Office. This was in the context of promoting policy decision making on the basis of sound information analysis.

2. See Appendices 2 and 3.

We have adopted Ofwat's econometric models to benchmark the authorities' operating efficiency against the companies in England and Wales. This consistency in method will allow trends to be compared over the medium to long term. It will also ensure that the Scottish industry can be compared with some of the most efficient water undertakers in the world.

We have noted the view of the Competition Commission that alternative methods may have a place. We have therefore developed a detailed alternative model to provide a second analytically robust result. This model is described in Appendix 3. All of these methods give very similar results, and this underpins our judgement that the analysis of relative efficiency is both accurate and robust.

2.2.1 Operating efficiency

The primary tool used in benchmarking the authorities' operating costs is the suite of econometric models that was originally developed by Ofwat to benchmark the companies in England and Wales. Full details of the models are set out in Appendix 2 of this report.

The information that is used to populate the models is taken from the Annual Returns submitted by the authorities in June each year. In addition, the models are updated each year with the latest information for the companies in England and Wales. This information is obtained from the companies' June Returns published by Ofwat.

In general, we seek to minimise any changes to the information that is submitted by the authorities. There are, however, some factors that could artificially benefit the authorities' relative efficiency positions. In order to preserve fair comparisons with the companies in England and Wales, we have made some minor adjustments.

In 2001-02 these adjustments included:

- adjusting downwards the distribution input information in the water service power model to avoid rewarding the authorities for high levels of leakage³;

- adjusting upwards levels of bad debt provision that were regarded as being unsustainably low; and
- reclassifying as base operating costs some of those costs that had been identified by the authorities as one-off costs.

As noted above, we also developed an alternative model to assess the relative operating efficiency of the three authorities⁴. This model is used to validate results obtained from the Ofwat econometric models. As with the Ofwat econometric models, the information used to populate this alternative model is taken from the authorities' Annual Returns. The same adjustments to the information supplied by the authorities are made in both cases.

Both modelling approaches generate an operating expenditure efficiency score for each authority. The scores for each authority are discussed in Chapter 3.

2.2.2 Capital efficiency

In addition to benchmarking operating expenditure, we also conduct an annual benchmarking exercise on the capital expenditure of the Scottish water industry.

The Strategic Review identified four areas within capital expenditure that could be targeted for efficiency:

- **Strategic asset management** - 'saving by not doing'. The decision not to spend should, however, only be considered as an efficiency if this is done without compromising output and performance measures.
- **Programme planning or investment appraisal** - 'doing it better'. This area of analysis considers whether projects deliver their objectives in the most cost-effective way.
- **Procurement** - 'buying it smarter'.
- **Innovation** - 'doing it the new way'. This analysis assesses the scope for innovation efficiency by comparing the impact of low-cost technologies with current practice.

3. The water service power model is explained in Appendix 2.

4. Details of the alternative model are set out in Appendix 3.

It is not possible to assess performance in non-procurement areas of capital efficiency on a reliable basis each year. We have therefore chosen to focus on procurement.

At the time of the Strategic Review, the greatest gap between the three authorities in Scotland and the companies in England and Wales was determined to be in the area of procurement. The analysis of procurement efficiency is therefore a useful proxy for overall performance.

Procurement efficiency is measured using the cost base, which contains standard costs that are relevant to both capital maintenance and capital enhancement expenditure. We request the cost base information within the Annual Return submission from the Scottish water authorities. The information consists of a set of capital unit cost estimates for standardised projects (standard costs). These standard costs relate to work that has been or is likely to be undertaken by the authorities as part of their future investment programmes.

The authorities are required to submit as many relevant standard cost estimates as possible. However, where the project type or size is unrelated to an authority's asset base and/or their current/future capital programme, authorities need not submit standard costs.

The standard costs submitted by the authorities are compared against the Ofwat benchmarks. The benchmarking scores for 2001-02 are set out in Chapter 4.

2.3 Efficiency targets

At the time of the Strategic Review it was not yet clear whether the Scottish Parliament would approve the creation of Scottish Water, therefore efficiency targets were calculated for the three individual authorities and also for Scottish Water.

Efficiency targets were set for both operating and capital expenditure. These were set such that the Scottish industry would close 80% of the efficiency gap that had been identified with the companies in England

and Wales. When we examined the performance of companies in England and Wales, we found that they had been able to close between 60% and 100% of their own operating efficiency gaps within five years, with an average improvement of 85%⁵. The performance record also showed that the degree of closure of the operating efficiency gap by individual companies was not influenced by the size of the initial gap.

In other words, there was no evidence to suggest that Scottish Water, with its relatively large efficiency gap, should not be able to close 80% of its gap by 2005-06. This analysis was published in the Strategic Review to support the efficiency targets⁶.

The targets were phased. The phasing of the efficiency targets was similarly informed by the performance record in England and Wales. We examined the degree of improvement achieved by companies over time periods of one to five years, to establish an appropriate, yet challenging, annual profile for Scottish Water.

The annual targets for Scottish Water are summarised in Table 2.1. The savings are relative to 2000-01.

Table 2.1: Annual efficiency targets set in the Strategic Review of Charges

Targeted annual savings	2001-02	2002-03	2003-04	2004-05	2005-06
Operating expenditure	£15m	£63m	£97m	£116m	£136m
Merger ⁷	£0m	£28m	£34m	£38m	£39m
Capital expenditure	£0m	£71m	£102m	£169m	£207m
Total	£15m	£162m	£233m	£323m	£382m

Table 2.2 sets out operating and capital expenditure savings as a percentage of the base year figure.

Table 2.2: Annual percentage efficiency targets set in the Strategic Review of Charges

Targeted annual savings	2001-02	2002-03	2003-04	2004-05	2005-06
Operating expenditure	4%	16%	25%	29%	33%
Capital expenditure	0%	14%	20%	25%	31%

5. This performance was achieved without spend-to save resources being provided by the customer in advance.

6. *Strategic Review of Charges*, pp195-196.

7. Merger savings include proceeds from disposal of assets.

2.4 Efficiency targets in context

The calculation of the likely efficiency gap with the comparator companies assumed that these companies would perform in line with the efficiency targets set by Ofwat in the course of the 1999 Periodic Review.

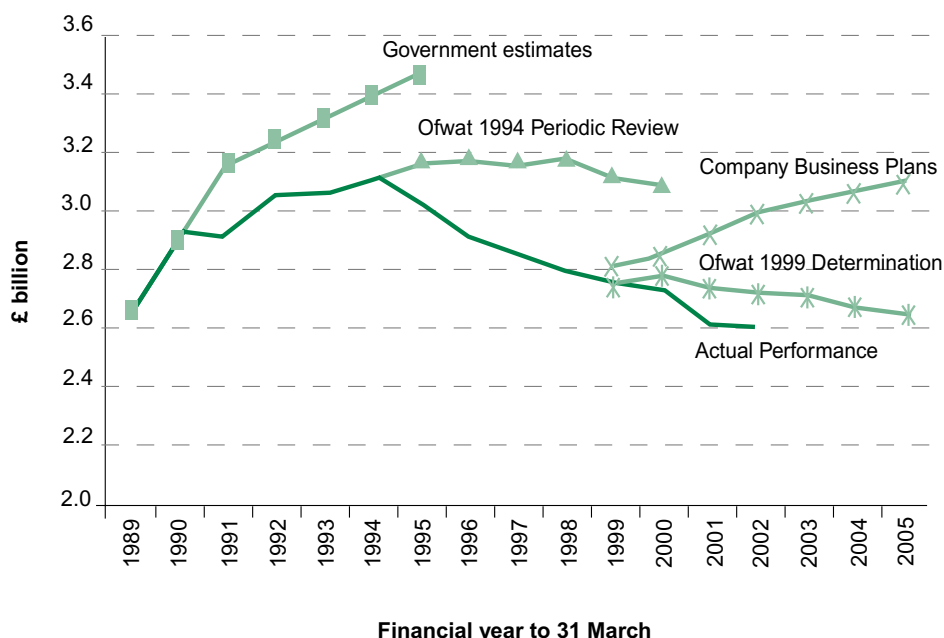
This will almost certainly underestimate the efficiency gap that will exist in 2005-06 for two reasons:

- Ofwat establishes targets which it believes a well managed company can better. This creates an incentive for management to outperform.
- History demonstrates that, although the companies' estimates of the resources they require are significantly higher than those allowed by Ofwat, the companies have, on average, always managed to outperform the targets set by the regulator. This is illustrated in Figure 2.2.

It is important to understand how Scottish Water would compare with the industry in England and Wales if it achieves the targets agreed as a result of the Strategic Review. We therefore reviewed the likely position of Scottish Water in 2005-06 relative to England and Wales. If it achieves its targets, in 2005-06 Scottish Water's operating efficiency would be similar to that of the leading water and sewerage company in the early 1990s (North West Water) and to that of the lowest ranked company (Welsh Water) in 2000-01.

This level of operating efficiency is likely to place Scottish Water around 25% behind the leading companies in 2005-06. It is therefore likely that further significant efficiency targets will need to be in place beyond 2005-06.

Figure 2.2: Comparison of operating costs with targets in England and Wales



Chapter 3

Operating expenditure efficiency results

This chapter reports progress in operating expenditure efficiency, and assesses the overall efficiency gap between each authority, Scotland as a whole and England and Wales in 2001-02.

3.1 2001-02 operating expenditure

The previous chapter outlined the scale of the efficiency savings expected during 2001-02. Table 3.1 sets out the operating expenditure of the authorities in 2001-02 in comparison to these targets.

Table 3.1: Calculation of allowable operating expenditure⁸

	East of Scotland Water Authority	North of Scotland Water Authority	West of Scotland Water Authority	Scotland
2001-02 audited operating costs (before exceptionals)	£187.8m	£170.3m	£223.1m	£581.1m
Less: depreciation and amortisation	(£55.1m)	(£49.1m)	(£67.2m)	(£171.7m)
Less: PPP ⁹	(£16.9m)	(£17.8m)	(£0.0m)	(£34.6m)
WICS adjustments:				
Subtract one-off costs	(£2.3m)	(£6.1m)	(£0.0m)	(£8.4m)
Addition to bad debt provision ¹⁰	£2.8m	£1.8m	£1.1m	£5.7m
Adjust own work capitalised ¹¹	£0.5m	£0.0m	£7.6m	£8.1m
Underlying controllable operating expenditure	£116.8m	£99.1m	£164.5m	£380.5m
Strategic Review target controllable operating expenditure	£101.3m	£90.9m	£168.3m	£360.5m
Difference	£15.5m	£8.2m	(£3.8m)	£20.0m

In order to be able to gain a true picture of the authorities' operating expenditure, it is essential to compare like with like. Year on year, it is possible for the authorities to make changes to items of expenditure that could artificially affect their efficiency position.

Examples of such changes include the following:

- Changing the authority's policy regarding capitalisation of operating expenditure. Increasing capitalisation effectively transfers costs from operating expenditure to capital expenditure, thus potentially making an authority appear more efficient on operating expenditure.
- Changing bad debt or other provisions without underlying cause.
- Categorising ongoing operating costs as exceptional/atypical when they are likely to recur.

Each year, we examine the information provided by the authorities in order to ensure that comparisons are being made on a like-for-like basis. This review has resulted in certain adjustments to the reported operating expenditure for each of the authorities in the year 2001-02. These are shown in Table 3.1.

Table 3.2 shows that each of the authorities made large provisions for exceptional costs in 2001-02. These exceptional costs relate principally to the severance and early retirement schemes that were put in place by the authorities. It would appear that each of the authorities targeted employment costs as a source of potential efficiency gains during 2001-02. This is not surprising since employment costs do constitute the single largest element of controllable operating expenditure. The achievement of the targets will, however, require Scottish Water to take a much wider view in order to identify opportunities to reduce all operating costs.

Table 3.2: Exceptional costs declared in 2001-02

	East of Scotland Water Authority	North of Scotland Water Authority	West of Scotland Water Authority	Scotland
Total	£11.6m	£19.6m	£25.9m	£57.1m

8. Numbers in this table are rounded and may not sum consistently.

9. Public Private Partnership: an agreement between an authority and a private contractor for the building and operation of an asset.

10. Adjustments to reported provision for bad debt, where available evidence does not support a change from 2000-01 levels.

11. Adjustments to the value of own work capitalised, where available evidence does not support a change from 2000-01 levels.

3.2 Trends in operating expenditure

The adjustments that are made to ensure that comparisons of performance between the current and the previous year also allow us to look at trends in costs since the authorities were first established in 1996. Figures 3.1 to 3.4 illustrate the authorities' performance compared to that of the companies in England and Wales. The costs are corrected for annual inflation and expressed as a percentage of 1996-97 levels. The costs reported by each authority have also been combined to show the relative performance in Scotland for the same period.

Figure 3.1: Base operating costs in East of Scotland Water Authority¹²

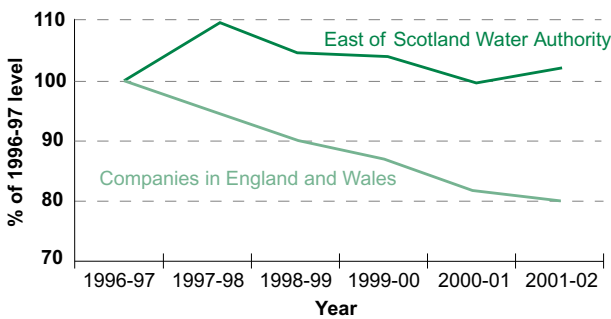


Figure 3.2: Base operating costs in North of Scotland Water Authority

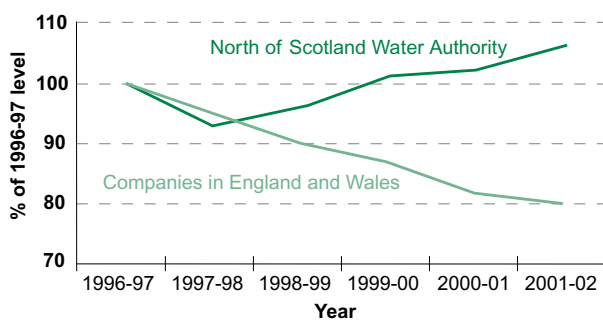


Figure 3.3: Base operating costs in West of Scotland Water Authority

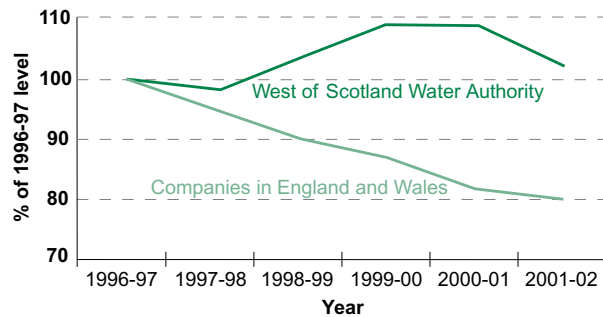
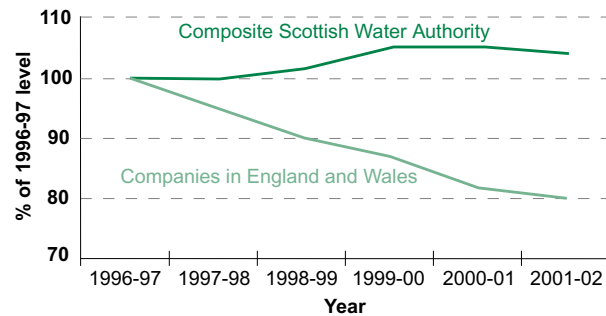


Figure 3.4: Base operating costs in Scotland



It is therefore clear that the performance of the water industry in Scotland has not matched that of England and Wales. At best, there has been a slight reduction in base operating costs since 1999-2000, but despite that improvement, the gap with England and Wales has widened.

During 2001-02, West of Scotland Water Authority significantly reduced its base operating costs and this broadly offset increases in the base operating costs of both East of Scotland Water Authority and North of Scotland Water Authority. The improvements achieved by West of Scotland Water Authority during its final year will need to be sustained and bettered by the new authority, Scottish Water, if the gap with England and Wales is to be closed.

12. Base operating costs are defined in Appendix 1.

3.3 Assessments of relative efficiency

The results of the two operating cost benchmark techniques would appear to confirm the trends observed in base operating expenditure. In each case, both methods demonstrate significant gaps in efficiency between the three authorities and the average company in England and Wales. This is illustrated in Table 3.3.

The results of the benchmarking exercise are outlined in Table 3.3. The efficiency gaps are expressed as a percentage in Table 3.4.

Table 3.3: 2001-02 efficiency scores

Authority/company	Econometric models	Alternative model
East of Scotland Water Authority	166	170
North of Scotland Water Authority	168	176
West of Scotland Water Authority	158	155
Scotland	163	165
England & Wales average	100	100

Table 3.4: 2001-02 efficiency scores

Authority	Econometric models	Alternative model
East of Scotland Water Authority	39.8%	41.2%
North of Scotland Water Authority	40.5%	43.2%
West of Scotland Water Authority	36.7%	35.5%
Scotland	38.7%	39.4%

However, it is not sufficient to look at the scores of the Scottish water industry in isolation. The results of this analysis not only confirm the size of the efficiency gap that was reported in the Strategic Review, but would appear to suggest that the gap is slightly greater than was assessed in the Strategic Review.

This is illustrated in Figures 3.5 and 3.6, which show how the authorities performed relative to their counterparts in England and Wales in 2001-02. The comparator companies for Scottish Water that we used in the Strategic Review were Northumbrian Water, Yorkshire Water and South West Water.

Figure 3.5: Relative operating expenditure efficiency scores - econometric models

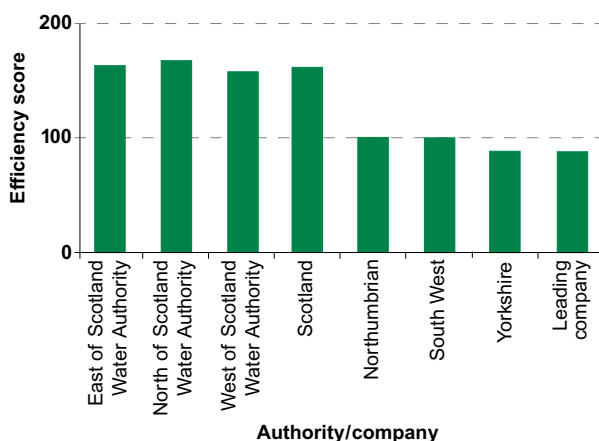
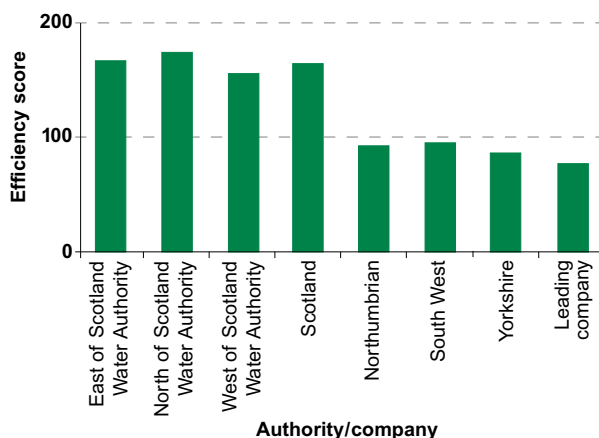


Figure 3.6: Relative operating expenditure efficiency scores - alternative model



The impact of the efficiency gap is perhaps best understood by converting the scores to monetary equivalents.

By calibrating the scores around an average England and Wales score of 100, the efficiency scores can be converted to monetary equivalents. If we take the scores from the econometric models as an example, for every £1 of operating expenditure in England and Wales, the authorities in Scotland incurred the levels of operating expenditure set out in Table 3.5.

Table 3.5: Costs of inefficiency in operating costs

Authority/company	Cost
East of Scotland Water Authority	£1.66
North of Scotland Water Authority	£1.68
West of Scotland Water Authority	£1.58
Scotland	£1.63
Leading England & Wales company	£0.88

3.4 Differences in scope and levels of service

Earlier in this report, we emphasised that the comparisons were conducted on a like-for-like basis. The adjustments noted earlier were made to ensure that reported financial costs were expressed on this like-for-like basis.

However, the scores illustrated in Figures 3.5 and 3.6 exclude one important element from the analysis - the significant differences between the scope of activities and levels of service offered by the Scottish authorities and that provided by the English and Welsh companies.

Examples of such differences include the following:

- **Leakage** - Ofwat sets leakage targets for the companies in England and Wales that are designed to take the companies to the economic level of leakage. Companies are required to keep leakage at these levels. No such targets are set in Scotland. It is estimated that the impact upon the companies' operating expenditure is approximately 3.5%-4%.
- **Domestic metering** - the companies in England and Wales incur higher costs because a larger proportion of their customer base is charged on a metered basis. This is estimated to have a 2%-2.5% impact on operating expenditure.
- **Customer service** - the companies in England and Wales offer higher levels of customer service¹³ than the Scottish authorities, for example in responding to customer complaints and queries. The impact of this on operating expenditure is estimated to be approximately 3.5%.

- **Compliance** - the companies in England and Wales achieve a higher level of compliance with the Drinking Water Directives. This is estimated to have an impact on operating expenditure of approximately 1.5%.

The impact of these and other differences varies between the companies. However, on average the companies would be able to reduce their operating costs by around 12% if they only had to provide the same scope of activities and level of service as the Scottish authorities.

The benchmarking scores reported in Tables 3.3 and 3.4 therefore do not take account of the differences in the scope and level of service provided by the water and sewerage industry in Scotland and in England and Wales. As a result, they underestimate the real operating efficiency gap. Table 3.6 shows the revised scores from the benchmarking models after taking these differences into account. As before, the scores have been calibrated around an average of 100 in England and Wales.

Table 3.6: Efficiency scores taking account of differences in scope and customer service

Authority/company	Econometric models	Alternative model
East of Scotland Water Authority	194	199
North of Scotland Water Authority	197	206
West of Scotland Water Authority	185	181
Scotland	191	194
England & Wales average	100	100

Table 3.7: Percentage gap to average English and Welsh company, taking account of difference in scope and customer service

Authority	Econometric models	Alternative model
East of Scotland Water Authority	48.5%	49.7%
North of Scotland Water Authority	49.2%	51.5%
West of Scotland Water Authority	45.9%	44.8%
Scotland	47.6%	48.5%

13. The level of customer service is objectively measured using Ofwat indicators, which are discussed in the *2001-02 Levels of Service* report. We will publish this report in March 2003.

Table 3.8: Percentage gap to leading English and Welsh company, taking account of difference in scope and customer service

Authority	Econometric models	Alternative model
East of Scotland Water Authority	54.6%	61.8%
North of Scotland Water Authority	55.3%	63.1%
West of Scotland Water Authority	52.4%	58.0%
Scotland	53.9%	60.8%

Figures 3.7 and 3.8 show the performance of the Scottish authorities compared to their comparator companies in England and Wales.

Figure 3.7: Relative operating expenditure efficiency scores allowing for differences in scope of activities and customer service - econometric models

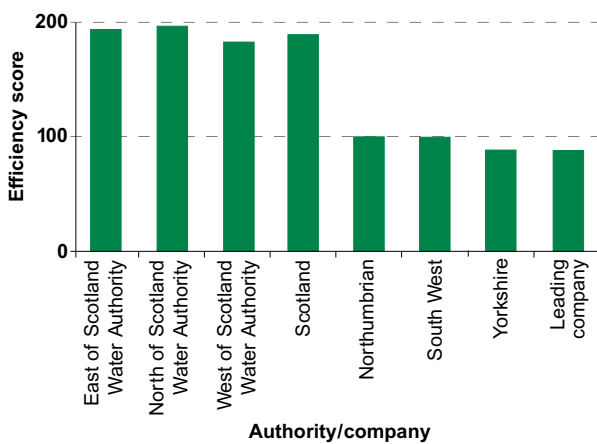
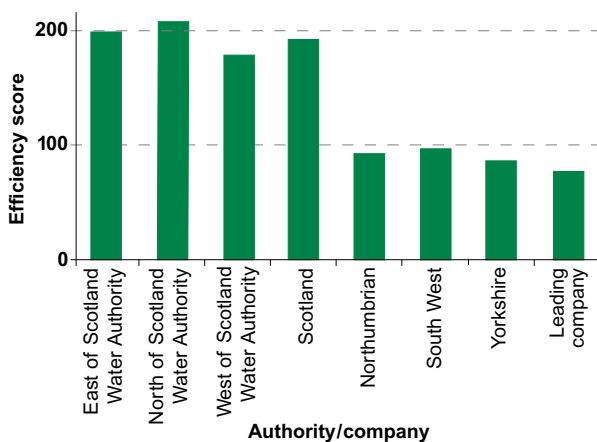


Figure 3.8: Relative operating expenditure efficiency scores allowing for differences in scope of activities and customer service - alternative model



Once again if the comparison is presented in monetary terms, the average English and Welsh company would incur £1 of operating expenditure to deliver a level of service and scope of activity that would cost each of the three authorities around £2. This is shown in Table 3.9 using scores from the alternative model.

Table 3.9: Comparison of relative efficiency in monetary terms

Authority/company	Cost
East of Scotland Water Authority	£1.99
North of Scotland Water Authority	£2.06
West of Scotland Water Authority	£1.81
Scotland	£1.94
Leading England & Wales company	£0.76

3.5 Quality of regulatory information

The analysis of the performance of the three authorities outlined earlier in this chapter is based on information submitted by the authorities in their Annual Returns. These returns are not subject to independent scrutiny. All of the information provided to Ofwat, in contrast, is verified by independent reporters.

In 2001-02, the Annual Returns from the authorities contained a number of significant changes to the information that is used in the analysis of operating costs. Many of these changes would have benefited the authorities in the modelling.

Examples include the following:

- Each of the authorities reduced its provision for bad debt. The reduction ranged from 24% for West of Scotland Water Authority to 62% in the case of North of Scotland Water Authority.
- East of Scotland Water Authority increased the reported number of billed properties by 6% for both the water and sewerage services.
- The reported total length of sewers in Scotland increased by 4%, with one area showing a 25% increase.

As part of the Annual Return, the authorities are required to submit a commentary explaining the source of the information and any assumptions they have made in completing the Return. In addition, the authorities should explain any significant changes.

It is clear that there needs to be further improvements, not only in the quality of information provided in regulatory submissions but also in the attention paid to the commentaries. In regulating the industry's performance, we rely on the commentaries to be complete and accurate. Unfortunately, in some instances significant changes in the information provided were not explained.

In carrying out the efficiency modelling on the 2001-02 information, we have, in most instances, given the authorities the benefit of the doubt and accepted the changes that were made. We have opted to take the view that these are most likely to result from improvements in information collection and reliability. However, if we had not accepted these changes, then the efficiency scores for Scotland would have been approximately 5% higher than those reported in Tables 3.3 and 3.6.

It is important that progress towards the efficiency targets is measured on a like-for-like basis and this will not be the case if Scottish Water does not provide the information that is used in our analysis on a consistent basis.

Chapter 4

Capital expenditure efficiency results

Capital expenditure efficiency can be achieved in various ways. In the *Strategic Review* we divided capital efficiency into four discrete areas (see section 2.2.2).

As noted earlier in this report, it is difficult to make an assessment of improvements in strategic asset management, programme planning or innovation on a reliable basis each year. Our investment and asset management report will discuss developments in these areas in more detail.

This chapter therefore reports only on progress in procurement efficiency, and assesses the overall efficiency gap in capital expenditure between each authority, Scotland as a whole, and England and Wales in 2001-02.

4.1 Sources of information

For the year 2001-02, we received cost base submissions from the three existing authorities, East of Scotland Water Authority, North of Scotland Water Authority and West of Scotland Water Authority, and a combined submission from the newly formed Scottish Water. The submissions from the three existing authorities were used to compare the procurement efficiency of the three authorities. The submission from Scottish Water will form a baseline for similar analysis next year.

4.2 Benchmarking results

Each of the three Scottish authorities demonstrated improvements in procurement efficiency in 2001-02. These improvements are shown in Table 4.1.

Table 4.1: Improvements in procurement efficiency

Authority	Improvement in procurement efficiency
East of Scotland Water Authority	8%
North of Scotland Water Authority	6%
West of Scotland Water Authority	6%
Scotland	6%

These improvements, although welcome, are unlikely to mean that the efficiency gap with the English and Welsh companies has closed significantly. Evidence published by Ofwat appears to show that the companies in England and Wales achieved annual efficiency savings of *at least* 5% in the period 1995 to 2000 and that this rate of improvement is being sustained. These savings are additional to the minimum efficiency targets that were set by Ofwat at both the 1994 and 1999 Periodic Reviews¹⁴.

In addition, the improvements demonstrated by the Scottish authorities relate to procurement efficiency alone and do not take account of the other areas that were identified in the Strategic Review as requiring improvement. There is some evidence based on the authorities' responses to WIC18¹⁵ that some of the 2000-02 capital programme was not delivered during that regulatory period. Any such failure to deliver the full programme may reduce or even reverse the apparent procurement efficiency.

Even if we assume that the water authorities matched the rates of improvement in England and Wales recently reported by Ofwat, the relative efficiency of each authority in 2001-02 would be as presented in Table 4.2.

Table 4.2: 2001-02 capital expenditure efficiency scores

Authority/company	Efficiency score
East of Scotland Water Authority	134
North of Scotland Water Authority	138
West of Scotland Water Authority	138
Scotland	137
England and Wales benchmark	100
England and Wales lowest submission	86

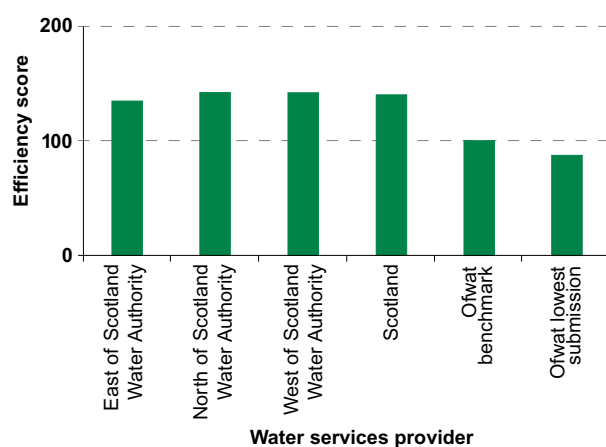
14. Ofwat, *Water and sewerage service unit costs and relative efficiency*, December 2002 quotes a 7% improvement in overall capital efficiency during 2000-01 to 2001-02 in real terms. This is over and above the 1.4% minimum annual improvement that was set for capital maintenance expenditure and the 2.1% minimum annual improvement that was set for capital enhancement expenditure.

15. WIC18, Quality and Standards Final Output, May 2001.

Table 4.3: 2001-02 capital expenditure percentage gap

Authority	Percentage gap	
	Best practice	Benchmark
East of Scotland Water Authority	35.8%	25.4%
North of Scotland Water Authority	37.7%	27.5%
West of Scotland Water Authority	37.7%	27.5%
Scotland	37.2%	27.0%

The efficiency scores are illustrated in Figure 4.1, which shows the performance of the authorities relative to best practice and to the Ofwat benchmark in England and Wales in 2001-02.

Figure 4.1: Relative capital expenditure efficiency scores

These scores can also be converted to monetary equivalents. In the case of capital expenditure, for every £1 spent by companies in England and Wales, the authorities in Scotland incurred the following costs to procure an identical capital output.

Table 4.4: Relative costs of investment

Authority/company	Cost
East of Scotland Water Authority	£1.34
North of Scotland Water Authority	£1.38
West of Scotland Water Authority	£1.38
Scotland	£1.37
England and Wales best practice	£0.86

4.3 Quality of regulatory information

The comparison made using the cost bases submitted by the authorities rely on the quality of information provided - perhaps to an even greater extent than is the case for operating cost models. This is because there is less opportunity to validate the information other than from the explanations included in the commentary.

We noted that there were significant differences between the standard capital costs reported by the authorities in 2001-02 and those reported in the previous year.

Examples of these fluctuations include the following:

- East of Scotland Water Authority increased one of its standard costs for installing a new water filtration system by 22%, and reduced another standard cost for installing additional secondary treatment at a sewage treatment works by 10%.
- North of Scotland Water Authority decreased its standard cost for building a new preliminary treatment works by 11% and the cost of building a new water treatment works by 9%.
- West of Scotland Water Authority increased one of its costs for building a new water treatment works by 49%, and reduced another standard cost for installing a new water filtration system by 19%.

In the main, the commentary provided by the authorities did not sufficiently explain the changes in the information submitted. We have, however, accepted all of the alterations. In future we would intend only to accept changes that had been fully explained in an appropriate commentary.

Chapter 5

The impact on customers

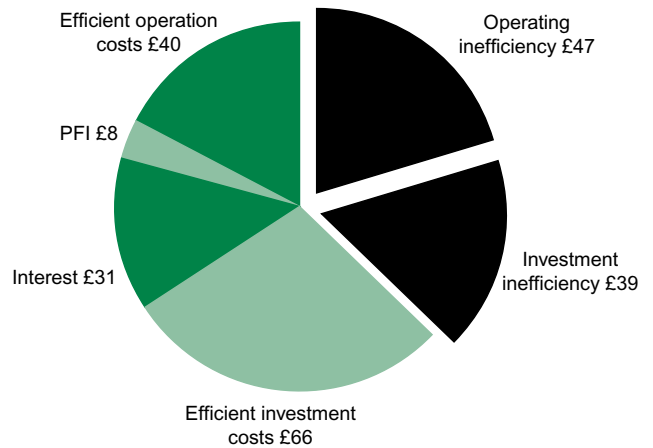
The amount paid by Scottish customers in bills, and the value for money they receive, is directly dependent on the level of efficiency achieved by the industry. The outlook for prices in the future depends on the pace and scale of efficiencies delivered by Scottish Water.

In the Strategic Review, we explained that with the increases in revenue recommended and the achievement of the agreed efficiency targets by Scottish Water, there was a likelihood that future increases in bills could be kept below the rate of inflation. This attractive prospect is only possible, however, if there is a significant relative improvement in the financial performance of Scottish Water.

In 2001-02, customers' bills included significant costs that would not have been incurred if the authorities were as efficient as the leading companies in England and Wales. For the average domestic customer, bills were an estimated £86 higher than they needed to be. In other words, a leading company in England and Wales could have reduced the Scottish average domestic bill from £231 to £145. This point is illustrated in Figure 5.1. This estimate assumes that domestic and non-domestic customers share the burden of inefficiency evenly.

Figure 5.1: Impact of inefficiency on domestic customers' average bills in 2001-02

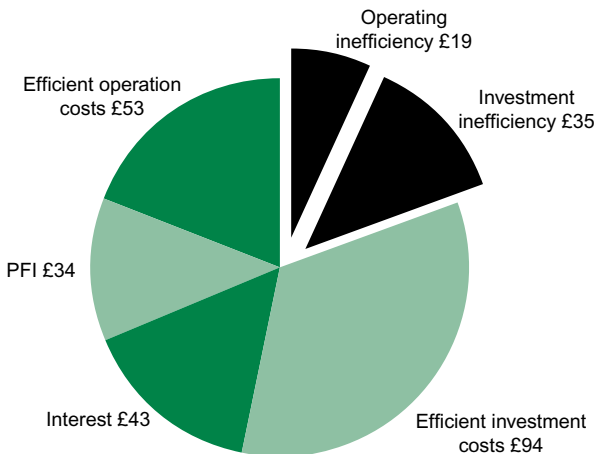
Average domestic bill = £231



The targets included in the *Strategic Review* are intended to reduce the impact of the efficiency gap on customers' bills. Nevertheless, even if Scottish Water achieves the targets in full, there will remain a significant cost element of bills in 2005-06 caused directly by inefficiency. As explained earlier, it was reasonable to require Scottish Water to narrow only 80% of the assessed 2005-06 efficiency gap. Figure 5.2 shows that the annual cost to the average domestic customer of inefficiency is still likely to be around £54 even in 2005-06. This assumes that Scottish Water meets its targets and that the companies south of the border improve no faster than was assumed at Ofwat's 1999 Periodic Review.

Figure 5.2: Impact of inefficiency on domestic customers' average bills in 2005-06, assuming Scottish Water achieves current efficiency targets

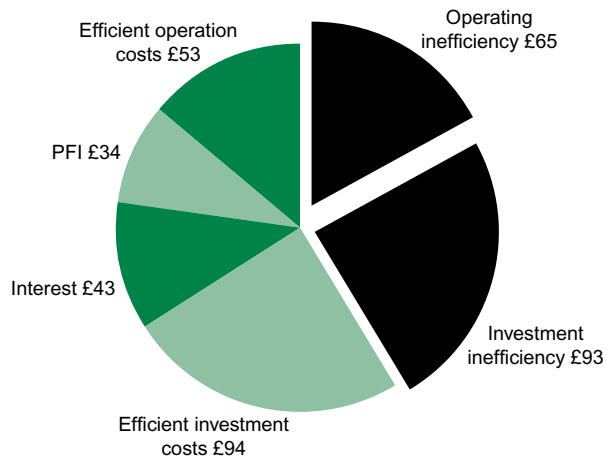
Projected average domestic bill = £278



If the revenue caps in the *Strategic Review* had not taken account of the scope for efficiency, customers' bills would have been significantly higher. This is illustrated in Figure 5.3.

Figure 5.3: Impact of inefficiency on domestic customers' average bills in 2005-06, without progress on efficiency¹⁶

Illustrative average domestic bill = £382



In this case the average domestic customer would have had to pay £158 per year because of the inefficiency of the service provider.

As economic and customer services regulator, we continue to monitor the performance of Scottish Water closely. This monitoring will continue to rely on the established benchmarking techniques described earlier. Monitoring is discussed in more detail in Chapter 6.

16. Impact of inefficiency is paid immediately from customer revenue.

Chapter 6

Monitoring performance against efficiency targets

The significant impact on customers' bills of the current level of inefficiency makes it imperative that we are able to monitor Scottish Water's progress towards the efficiency targets that were set as part of the last Strategic Review. We maintain regular, independent scrutiny of Scottish Water, using information from a variety of sources, including the following:

- Scottish Water's Annual Report and Accounts;
- the annual June Return submission from Scottish Water;
- monthly Resource Accounting and Budgeting (RAB) tables submitted by Scottish Water to us and to the Scottish Executive; and
- quarterly capital investment tables.

It is a matter for the management of Scottish Water to determine how best to approach its efficiency targets. However, continuous monitoring of Scottish Water's progress allows us to identify any potential areas of concern. Regular scrutiny of operating and capital expenditure also helps ensure that Scottish Water continues to report figures on a like-for-like basis. This facilitates objective and fair year-on-year comparisons with the companies in England and Wales.

We also actively monitor the progress of the companies in England and Wales towards the efficiency targets that Ofwat set at the 1999 Periodic Review. This analysis allows us to assess relative performance in Scotland.

6.1 Operating expenditure

The key operating costs that are being monitored are as follows:

- **Base operating expenditure**¹⁷: to assess underlying progress in reducing costs for a given level of service (i.e. the rate of improvement in operating efficiency).
- **Spend to Save**¹⁸: to ensure that expenditure represents a good investment for customers.

It is important that the reconciliation of base to total operating expenditure is soundly based. In this regard, the following principles are applied to the information reported:

- Do forecast outturns of all components show consistency with the reported year to date figures and trends?
- Can movements in the provision for bad debt be fully explained (since a reduction in the provision could artificially reduce costs)?
- Is new operating expenditure¹⁹ consistent with measures taken to improve service, and additions/enhancements to the authorities' operational assets?
- Are PPP costs correctly allocated, and within the limits agreed in the Strategic Review?
- Is the declared level of own work capitalised consistent with changes in the amount of capital investment?
- Is Spend to Save expenditure within the limits set by the Strategic Review, and properly justified?
- Are accounting items, exceptionals, provisions and non-recurring costs correctly allocated and explained?
- Do any changes in the allocation of core and non-core business costs affect the interpretation of trends in base operating cost?
- Do any other relevant changes in accounting policy affect the interpretation of trends in base operating cost?

17. Base operating expenditure is defined in Appendix 1.

18. Spend to Save expenditure is spending now to save money later. For example, redundancy payments now should reduce wage bills in the future. In the *Strategic Review*, an allowance of £200 million, over four years, was provided to Scottish Water to help meet the upfront costs of addressing the efficiency gap. We are not aware of any precedent for such an allowance to be included upfront in a regulatory revenue cap. It is therefore of the utmost importance that we are able to monitor this allowance in detail to ensure that customers' interests are protected.

19. New operating expenditure is the net additional expenditure associated with improvements.

In the event that a reported cost component appears to be inconsistent or anomalous according to these principles, it may be necessary to adjust the calculation of base operating expenditure, unless the item can be justified.

6.2 Capital expenditure

Capital investment is closely monitored and will be discussed in our annual report on asset management and investment. Since investment needs vary year on year, it is not possible to monitor performance trends using levels of expenditure. Instead, we will continue to use the cost base analysis to compare procurement efficiency from one year to another. We are able to relate this performance to England and Wales using annual information published by Ofwat. Unfortunately detailed comparison of relative annual performance is not possible because Ofwat only carries out a full review of cost base information every five years.

To complement our analysis of procurement efficiency, we will continue to carry out a series of audits each year of capital investment appraisals in Scotland and compare them with best practice.

6.3 Overall performance assessment

Conclusions on the pace and scale of efficiency improvements by Scottish Water need to take into account overall performance. There are five critical factors that have an impact on customers' interests:

1. Are levels of service improving in line with expectations?

Efficiency improvements require levels of service to remain stable or improve, while reducing costs.

2. Are investment plan outputs being delivered, sustainably, to time and within budget?

Future progress on efficiency is likely to depend on investment outputs being achieved.

3. Is depreciation being charged at a sustainable level, taking prudent account of asset lives?

Underprovision for depreciation could jeopardise the sustainability of Scottish Water.

4. Are other cost movements (new business, asset disposals, new debt, interest payments) in line with expectations?

A shortfall against expectations could offset financially some of the gains achieved in efficiency.

5. Is Scottish Water on track to narrow the efficiency gap with companies in England and Wales?

The more the gap is narrowed, the better the value for money for customers.

The monitoring of efficiency improvements by Scottish Water will therefore be assessed in the light of these five critical factors. From a regulatory standpoint, conclusions of analyses will recognise that underperformance in one area may well be compensated by outperformance in another. We will, however, continue to challenge the management of Scottish Water to improve its performance in all areas.

Chapter 7

Conclusions

This is the first annual costs and performance report for the water industry in Scotland. Our analysis of the information has revealed a number of critical issues:

1. The Scottish industry was less efficient in 2001-02 than it was in 1996-97.
2. During the same period, companies in England and Wales improved both their absolute and relative level of performance.
3. The result is that some £86 of the average domestic bill of £231 is paying for inefficiency.
4. Scottish Water is tasked with narrowing 80% of the efficiency gap with companies in England and Wales by 2005-06. Although this is a challenging target, even if achieved in full, inefficiency would still cost the average domestic customer some £54 per year in 2005-06.
5. Scottish Water must improve the quality of information and commentary that it provides to us. This is fundamental to ensuring that proper, fair and objective comparisons can be made.

This annual report will enable all stakeholders in the Scottish industry to understand better its performance relative to that of comparator companies in England and Wales. Such understanding can only improve the value for money for customers in the medium to long term.

Appendix 1

Defining operating and capital expenditure

Sources of information

Our evaluation of the relative efficiency of the Scottish water authorities is based on information provided by the authorities themselves. The primary source of that information is the annual June Return. The Return is designed to capture information on all aspects of the water authorities' businesses, including customer numbers and characteristics, assets and costs. In addition, the authorities are required to provide comment as to the source and accuracy of the information they submit. However, unlike the information submissions made by the English and Welsh companies to Ofwat, the Scottish water authorities' Returns are not subject to independent external scrutiny prior to submission.

Definition of operating expenditure

Components of operating expenditure

Operating expenditure comprises day-to-day running costs, as opposed to capital investment or financing costs. Operating expenditure therefore includes employment costs, electricity, materials, hired and contracted costs, local authority rates, insurance, software licences, and vehicle running costs. Bad debt is also regarded as an operating cost.

The operating costs incurred by the water and sewerage service undertakers in the UK are collected using a consistent breakdown of that expenditure. This facilitates benchmarking, and allows us to analyse costs without large adjustments. The June Returns from the Scottish water authorities allow us to analyse operating costs by both function and activity. The analysis of expenditure by function provides information on what it costs to provide a particular service. The analysis by activity shows the cost of each activity comprising a service. The breakdown by function is shown opposite:

- **Water service:**

- Water resources and treatment
- Water distribution
- Business activities

- **Sewerage service:**

- Sewer network
- Sewage treatment
- Sludge treatment and disposal
- Business activities

The breakdown by activity is as follows:

- **Direct costs:**

- Employment
- Power
- Hired/contracted services
- Agencies
- Materials and consumables
- Charges levied by environment regulator
- Bulk water imports
- Other

- **General and support**

- **Business expenditure:**

- Customer services
- Scientific services
- Local authority rates
- Doubtful debts
- Exceptional items
- Third party services
- Other

The Return defines these functions and activities clearly and uses the same definitions as Ofwat.

Underlying operating expenditure

One-off items of expenditure, which are unlikely to be repeated on a regular basis, can affect reported operating expenditure. Examples would include the costs of abnormal pension contributions, redundancy payments, rates rebates, and unusual weather conditions.

Benchmarking analysis should be both accurate and fair. Assessment of the Scottish water authorities' relative efficiency in operating expenditure therefore takes into account reported one-off costs, both their own and those reported by companies in England and Wales.

Base service operating expenditure

There are many factors that could justifiably increase operating costs. These include:

- better standards of customer service,
- growth in the customer base,
- growth in customer demand,
- more sophisticated and effective processes for treating drinking water or sewage effluent.

We have endeavoured to make adjustments to ensure that such factors are taken into account before comparing trends in operating expenditure. The pace of improvement required, and the resulting cost increase, may vary from region to region, or over time.

As a consequence, the water authorities report two operating expenditure figures; one for base service and one for total operating expenditure²⁰. Base service expenditure comprises the cost that is incurred simply to maintain a constant level of service from some agreed starting point. Total operating cost includes the base service and net additional running costs associated with improvements. It is possible to compare the underlying trends in operating expenditure more fairly if new net additional costs are stripped out.

Factors that influence operating expenditure

There are several important factors, other than management efficiency and employee productivity, that can influence operating expenditure in the water industry. They include:

- difficulty of operating environment (population distribution and density, topography and terrain, water availability and types of source, coastal or inland character, etc);
- customer mix (domestic, non-domestic, metered, unmeasured, large/small industrial user);
- customer requirements (resolving complaints, etc);
- environmental requirements (leakage levels and targets, restrictions on water resource use, sewage effluent standards, etc);
- nature of the assets operated and maintained (size, mix, performance);
- volumes (water consumption, peak use, sewage loads);
- regional variations in charges for local authority rates, water abstraction, sewage discharges;
- regional variations in services such as mains diversions and sewer diversions ('third party' services);
- regional variations in market rates for salaries, electricity or other costs.

These cost drivers can be regarded as outwith significant management control in the short term, for an efficiently run business. However, poor management can mean that charges incurred for local authority rates or electricity are higher than they need to be, or that insufficient attention is paid by managers to limiting the impact on costs of their operating environment.

The approach to benchmarking is therefore to determine, by detailed analysis of the available information, the way in which the factors listed above influence actual operating expenditure for each of the water authorities. Our econometric models estimate the effect on costs of operating environment, 'customer base' and assets and volumes. We exclude costs that may be affected by regional distortions such as local authority rates.

20. The companies in England and Wales also report two operating expenditure figures.

Our aim is to normalise costs across all of the authorities and their comparators, so that the variations that remain are likely to be associated with differences in efficiency. Comparisons of normalised operating expenditure allow us to calculate fair efficiency scores for each authority.

Definition of capital expenditure

Capital expenditure can essentially be divided into two categories - capital maintenance and capital enhancement. The Quality and Standards 2 process that determined the investment programmes for Scottish Water for the period 2002-06 included both of these categories of capital expenditure. It is important to note that the expenditure that is being benchmarked is actual cash expenditure, not depreciation as charged in the accounts. The efficiency targets that were set at the 2001 Review for capital expenditure apply to the total investment programme.

Capital maintenance

The water authorities incur capital maintenance costs for maintaining current levels of serviceability of their assets. For reporting purposes, authorities break down their costs in two complementary ways. These are by operational asset classification and by accounting asset classification.

The breakdown by operational asset is shown below:

- **Water service:**

- Water resource facilities
- Water treatment works
- Water distribution mains
- Service reservoirs and water towers
- Pumping stations
- Management and general

- **Sewerage service:**

- Sewerage
- Sea outfalls and headworks
- Sewage treatment works
- Sludge treatment works
- Sludge disposal
- In line pumping stations
- Terminal pumping stations
- Management and general

The breakdown by accounting asset is shown below:

- **Infrastructure assets:**

- Underground systems
- Impounding and raw storage reservoirs
- Dams
- Sludge pipelines and sea outfalls

- **Non-infrastructure assets:**

- Operational assets
 - Intake works
 - Pumping stations
 - Treatment works
 - Boreholes
 - Operational land
 - Offices, depots and workshops
 - Residential properties directly connected to supplies
 - Land held for the purpose of protecting the wholesomeness of water supplies
- Other tangible assets
 - Non-operational plant
 - Machinery
 - Vehicles
 - Surplus land

Capital enhancement

The water authorities incur capital enhancement costs for improving current levels of serviceability of their assets through building new assets such as sewage treatment works and water mains. For reporting purposes, companies break down their costs in two complementary ways, which are shown above under capital maintenance.

Appendix 2

Operating expenditure econometric models

Details of Ofwat's operating efficiency models were published in the Ofwat technical paper *Assessing the scope for future water and sewerage company efficiency* (April 1998). Updated models were published in Regulatory Director letter RD2/99 (January 1999).

Water service

The water service has been split up into four sub-service models, and these are summarised in Table A2.1.

Table A2.1: Water sub-service models

Sub-service	Model type	Explanatory variables
Water resource and treatment	Linear model for unit cost	Population, number of sources, distribution input, proportion of supplies from rivers
Water distribution	Log unit cost	Population, proportion of total mains length with diameter > 300mm
Water service power	Log linear	Distribution input, average pumping head
Water business activities	Log linear	Number of billed properties

• Water resource and treatment model

This model predicts the costs associated with water resources, the treatment process and the operating environment. Specifically, it takes into account economies of scale at water source level, and the difficulty of treatment as determined by the proportion of supplies that are taken from rivers. Costs per head are modelled rather than volumetric unit costs. This is in order to avoid rewarding high leakage, or penalising companies that have minimised demand.

• Water distribution model

Ofwat carried out a thorough review of the potential cost drivers for water distribution. There was no evidence in the reported information to suggest that mains length is a valid cost driver; and it is statistically inferior to alternative measures of scale. It was found that the length of large diameter mains (300mm diameter or more) is, however, significant. This result was not surprising because repairs, maintenance and inspection on large mains incur much greater costs than those on small mains. The model also reflects the higher costs of operating in urban areas, where the density of underground services and traffic congestion can impair productivity.

The model uses the ratio of the lengths of large mains to small mains as the cost driver. The unit costs are again expressed per head of population, rather than by volume. This reduces the potential to penalise companies with low leakage and/or low demand.

• Water service power model

This model is based on the physical relationship between the amount of water pumped and energy required. It incorporates both vertical lift and additional lift to overcome friction in pipes. The model recognises that economies of scale are available in pump maintenance and negotiation of electricity tariffs.

• Water business activities model

This model relates business activity costs to the number of billed properties. It recognises that there are economies of scale. Other potential cost drivers, for example the number of complaints, are ultimately within management control, and so are not considered valid explanatory factors.

Sewerage service

The five sub-service models are summarised in Table A2.2.

Table A2.2: Sewerage sub-service models

Sub-service	Model type	Explanatory variables
Sewerage network	Log linear	Sewer length, area, resident population, holiday population
Large sewage treatment works	Log linear	Total load, use of biological treatment, use of activated sludge, tight effluent consent for suspended solids and BOD ²¹
Small sewage treatment works	Unit cost	Works size, works type, load
Sludge treatment and disposal	Unit cost	Weights of dry solids, disposal route
Business activities	Unit cost	Billed properties

• Sewerage network model

This model expresses costs per unit length of sewer. It takes into account the amount of sewage being transported along the sewer. This is a function of area since this will affect surface drainage and costs associated with remoteness. This is also a function of population as this will impact on sewage volumes. The model takes account of the higher costs expected in regions with a significant holiday population.

• Large sewage treatment works model

The large sewage treatment works model covers those sewage treatment works serving a 'population equivalent' of at least 25,000. Population equivalent is a measure of the amount of sewage treated, both domestic and industrial, expressed in terms of the number of domestic customers required to produce a similar volume.

The model takes into account the sewage load reaching the treatment works; the type of treatment in place (e.g. activated sludge increases power costs); and the quality of the discharged effluent required to meet environmental standards. The model exhibits considerable economies of scale in the treatment of sewage at the level of individual works.

• Small sewage treatment works model

This model uses average unit costs across England and Wales. This model therefore requires less information than the large works model. This is a necessary simplification given that there are thousands of small sewage treatment works. The cost matrix takes into account the scale of the works - there are significant economies of scale - and the type of treatment process employed. An extra Band 0 was added to the matrix to take account of the very small works found in some regions of Scotland.

• Sludge treatment and disposal model

This model compares the costs of sludge treatment and disposal to the volume treated and the methods of disposal available. The model uses average unit costs across England and Wales. The unit cost approach is again a necessary simplification given the large number of sludge treatment and disposal facilities.

• Business activities model

This model uses an average unit cost per billed property across England and Wales. There are too few sewerage companies of sufficiently different size to allow economies of scale to be estimated. Sewage is treated by the ten large privatised companies in England and Wales.

21. Biological Oxygen Demand - a measure of the pollution potential of sewage effluent.

Appendix 3

Operating expenditure alternative model

The alternative model was developed for two reasons: firstly to respond to the view expressed by the Competition Commission in its enquiries into the price limits set for Mid Kent Water and Sutton & East Surrey Water at the Ofwat 1999 Periodic Review; and second in order to confirm the result of the econometric models.

The alternative model was designed to take full account of the special circumstances surrounding the provision of water and waste water services in Scotland. It uses a fundamentally different approach from the econometric models. It is based on the premise that in most parts of the business, running costs are driven by asset use, volumes and customers. This contrasts with the econometric models, which examine the interrelationships between these and other drivers, and concentrate only on those that best explain cost variation between companies.

This approach splits the business into ten different areas, as follows:

- delivery of water,
- resource and treatment,
- business activities water,
- bad debt water,
- simple sewage treatment,
- complex sewage treatment,
- running the sewer network,
- processing sludge,
- business activities sewerage,
- bad debt sewerage.

Each business area was examined to determine the most appropriate cost drivers. The number of cost drivers varies between one and five. The number depends on the quantity of material factors that influence the operating cost of each area.

The ten areas are combined to determine the overall efficiency of each company. Our analysis of these ratios took account of any one-off costs and inflation and therefore ensured that all relevant costs in the delivery of water and waste water services had been considered.

In order to use this model we had to estimate unit costs for each component. The unit cost estimates were determined in a number of ways, depending on the source and accuracy of the information available. The unit costs fell into the following categories:

- Category 1 - calculated directly from England and Wales or UK information;
- Category 2 - calculated to sum to reported England and Wales or UK totals;
- Category 3 - internal Ofwat/Water Industry Commissioner for Scotland figure based on company evidence;
- Category 4 - figure derived from econometric model;
- Category 5 - plausible estimate;
- Category 6 - balancing item.

Prudent tolerance ranges were incorporated into the model in a standard risk analysis software package. We did this to ensure that the efficiency targets are determined for the authorities as robustly as possible. The tolerance ranges reflect the maximum uncertainty in the unit cost estimates, and are as follows:

- Category 1 => +/- 20%
- Category 2 => +/- 25%
- Category 3 => +/- 33%
- Category 4 => +/- 50%
- Category 5 => +/- 50%
- Category 6 => +/- 50%

Economies of scale are also incorporated into the model because we wanted to be sure that our results took account of the different size of assets used by each company and authority. We were therefore able to determine a standard sized asset and hence to calculate a single unit cost.

We wanted to ensure that both the econometric modelling and the alternative approach, although different and independent of one another, were consistent. It, however, could be argued that this model should benefit the authorities more than the Ofwat econometric models. This is because this model is more asset based.

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