National Grid Transco - Potential Sale of Network Distribution Businesses

Regulatory Impact Assessment

National Grid Transco

Executive summary

NGT intends shortly to launch an auction inviting offers for five of its gas distribution Networks (DNs). NGT will only sell DNs if this is in shareholders' interests, and in particular, if sale proceeds exceed the value of the DNs to NGT and the costs of the transaction. This implies that NGT will only sell DNs if premia to their regulatory values can be achieved.

Following extensive discussions with potential buyers over the last six months, NGT is confident that there is significant market interest for its DNs from other UK utilities, foreign utilities and financial buyers. During market testing many of the UK utilities have indicated that they are most interested in DNs that have a degree of geographic overlap with their own operations. This is based on the synergies they expect to be able to extract from the combination of a DN with their existing electricity and/or water business. NGT's intention would be to sell 2 to 4 DNs, thus creating a number of comparator gas distribution companies.

The creation of such comparators would generate a significant net benefit for gas consumers, conservatively estimated at between £365 million - £558 million (in 2000 prices). This benefit is over and above any benefits arising from the introduction of separate price controls and is generated from:

- merger savings available to utility buyers in the period immediately after acquisition; and
- the impact of comparative competition between separately owned companies in perpetuity.

The analysis of recent mergers provides strong evidence that the introduction of highly incentivised new management leads to considerable out-performance in target companies, particularly through early reductions in operating costs. Such savings help to justify the significant premia paid relative to the acquired regulatory values (11-29%) in recent transactions. A report commissioned by NGT from Accenture concludes that the potential merger synergies available to buyers of a DN are of the order of 20–30% of the controllable operating costs of a DN. Approximately half of these savings consist of combination synergies, which are currently not accessible to NGT and hence not available to consumers. Unlocking those should result in a step-change increase in efficiency for the sold DNs, which would set a lower benchmark for Ofgem's efficiency comparisons at subsequent price reviews, to the significant benefit of consumers.

The value of comparators within the framework of yardstick regulation has been a notable feature of the electricity and water industries following privatisation. In gas too, customers should expect to benefit in perpetuity from cost savings generated by competing management teams who face efficiency comparisons at successive price reviews. It is difficult to quantify precisely the benefits attributable to comparative competition, although much thought has been devoted to this issue by regulators and the Competition Commission in reviewing proposed same-sector mergers. In particular:

- Ofgem's policy on electricity distribution mergers identifies a detriment to consumers that arises from the impact of such mergers on comparative regulation in the sector and specifies a one-off charge of £32 million payable over five years;
- Ofwat has consistently argued that the benefits to customers of comparative competition between separately owned (as opposed to separately licensed) companies are even larger.

NGT would expect to see a large measure of regulatory consistency between sectors in this important policy area.

NGT's net benefit analysis includes an estimate of the costs to the industry of the separation and sale of DNs of between £10 million and £18 million, taking account of NGT's proposal (supported to a large degree by the industry) to minimise the changes necessary to gas shippers' systems should this proposal be pursued.

In addition, NGT's proposals would facilitate certain other programmes currently being pursued by Ofgem. In particular, benefits arising from reform of the Supply Point Administration regime and the development of arrangements between gas transmission and distribution could be accelerated as a result of separation and sale. NGT will continue to work closely with Ofgem to develop these programmes.

In summary, NGT believes that there is a strong case for the Authority to continue to devote resources to working with NGT and the industry to create an acceptable industry architecture to allow separation towards the beginning of the fourth quarter of 2004.

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1. Introduction

As an aid to Ofgem's consideration of the detail of the regulatory impact assessment (RIA), this submission sets out NGT's detailed assessment of the achievable net consumer benefit of network sales. These estimates, while arguably still conservative, far exceed those set out by Ofgem under any number of reasonable scenarios.

The analysis supporting this paper has been updated following the recent Ofgem consultation process and picks up some of the comments raised.

2. NGT's evaluation of the consumer benefits of network sales

As set out below, NGT believes that the creation of independent comparators would generate significant net benefits for gas consumers, of the order of £365 million to £558 million (in 2000 prices). This benefit is over and above any benefits arising from the introduction of separate price controls. It is based on a detailed analysis of the aggregate benefits arising from:

- merger savings, which result from the integration of a DN within an existing utility's operations, and which can be estimated to provide an up-front step-change reduction in costs equivalent to 9-13% of the DN's opex base, and
- comparative competition, which result from the creation of independently owned comparators, and which can be estimated to generate 1.3% of incremental efficiency savings per annum.

In addition, NGT's proposals would facilitate certain other programmes currently being pursued by Ofgem. In particular, benefits from the reform of the Supply Point Administration regime and the development of arrangements between gas transmission and distribution could be accelerated as a result of separation and sale.

2.1. Comparative competition

Separate price controls

In introducing separate price controls for Transco, Ofgem intends to achieve a number of objectives:

- provide greater regulatory flexibility that protects consumers in the event that Transco decides to sell one or more DNs;
- provide a greater opportunity to compare the performance of DNs and so enable more effective regulation; and
- provide greater focus for the management of the DNs, enabling greater efficiency gains that can be shared with consumers

Many industry participants have expressed doubts about the extent to which the introduction of separate price controls alone can deliver net benefits to consumers as long as the DNs are under common ownership of NGT:

- the current Transco structure already gives Ofgem the ability to model comparative efficiency, and it is thought unlikely that the introduction of separate controls will in itself significantly improve the information available to Ofgem if all DNs continue to be owned by NGT;
- under common ownership, comparative analysis may give NGT a perverse efficiency incentive which has the potential to act as a deterrent for savings to be realised; and
- suppliers and shippers will incur costs to enable separate price controls: these include costs to modify their customer billing systems to handle regional pricing and increased costs of customer information and management.

The industry concerns have been most forcefully articulated by BGT, who stated in their August 2002 response that "… only under separate ownership would the incentives for comparative regulation be fully effective … there are no significant opportunities for enhanced efficiency savings through comparative analysis whilst LDZs are under common ownership …", and concluded that "… therefore any benefits of separate controls are only likely to be realised once the individual units cease to be owned by Transco …"

In addition, the Monopolies & Mergers Commission, in its report on the proposed merger of Wessex Water and South West Water, remarked that the Director General of Water Services had drawn attention to "the fundamental importance of diversity of ownership of water companies,

which was likely to secure the widest diversity of management styles and techniques and which was therefore also important for comparative purposes… the key issue was the number of separately-owned companies rather than the number of [licence holders].[1]"

NGT agrees with these sentiments and believes that a change in ownership is required to unlock the full benefits of comparative competition. The key point is that management drive efficiency improvements and only separate ownership produces genuinely distinct management.

Separate ownership

Ofgem's principal objective is to protect the interest of consumers, where appropriate by promoting effective competition. In the case of distribution companies which are network monopolies, the promotion of effective competition can be supported through fostering the natural rivalry which exists between them and making effective use of comparisons between these companies in setting price controls.

The value of comparators within the framework of yardstick regulation has been a notable feature of the electricity and water industries following privatisation. In gas too customers should expect to benefit in perpetuity from cost savings generated by competing management teams who face efficiency comparisons at successive price reviews. The introduction of comparative competition in gas distribution would yield the following benefits:

- it will give all DNs, both sold and retained, greater incentives to achieve efficiency savings;
- it will improve data transparency and reliability, giving Ofgem greater ability and confidence to pass on those efficiency savings to consumers by setting more challenging targets.

Ofgem has made an initial valuation of the benefits that can be achieved through comparative competition which is within the range of £150 million - £330 million. The Ofgem method is based on the assumption that, if DNs are sold, the resultant comparative competition will increase the average efficiency gains from around 3% to 4.3% per annum. This was based on the observation that there is a structural difference between the rates of savings passed on to consumers in industries with comparative competition (DNOs and WaSCs) and those in industries without (Transco, NGC).

These numbers are consistent with the approach adopted by Ofgem to value the loss of comparators in the electricity distribution sector (Ofgem's May 2002 Policy Statement : "Mergers in the electricity distribution sector"). Using this approach, Ofgem has made real one-off reductions of £32 million to the revenue of each merged electricity distribution company; Ofgem clearly believes that the value of comparators is real and significant.

Although it is difficult to quantify precisely the benefits attributable to comparative competition, much thought has been devoted to this issue by regulators and the Competition Commission in reviewing proposed same-sector mergers. In particular, on the basis of its own modelling Ofwat has consistently argued that the benefits to customers of comparative competition between separately owned (as opposed to separately licensed) companies are considerable; so large, in fact, as effectually to create a block on future mergers in that sector. More detail on this is provided in Appendix C.

While it is hard to make a precise estimate of the financial benefits of comparative competition, we believe that Ofgem's estimate is extremely conservative:

- it is based on an assumption that, even in the absence of comparators, Ofgem is able to re-set allowed opex at the start of each price control period to the level that would have been achieved under comparative competition;
- it is based on an assumption that benefits are only available for 15 years; and
- it does not take into account the early merger savings available to potential buyers of DNs, which are discussed in the next section.

2.2 Merger savings

UK utility merger experience provides strong evidence that new managements can achieve significant cost reductions in target companies, typically driven by 20% - 30% early reductions in controllable operating costs. Mergers tend to act as a catalyst that allows the new owners to

[1] *Wessex Water Plc and South West Water Plc: A report on the proposed merger*, page 56

introduce performance improvement changes to the combined business that would otherwise take much longer to realise. In addition, new management will generally be pushing hard to meet public promises made to shareholders and analysts at the time the merger is announced. Such savings help to justify the significant premia to the acquired regulatory values (11-29%) paid in recent transactions.

NGT has commissioned a report from Accenture, which analyses the type and scale of cost savings available to utility buyers, and draws on Accenture's long experience advising merging utilities. The conclusions of their report, which has been made available confidentially to Ofgem, are presented below.

Based on a bottom-up review of the operating cost base of a typical DN, and the cost saving initiatives available to utility buyers, the Accenture report concludes that the potential merger synergies available to a trade buyer are 19-26% of a DN's controllable opex base. This level of savings reflects what a buyer can reasonably be expected to deliver in the first three years following the transaction, and consist of the following components:

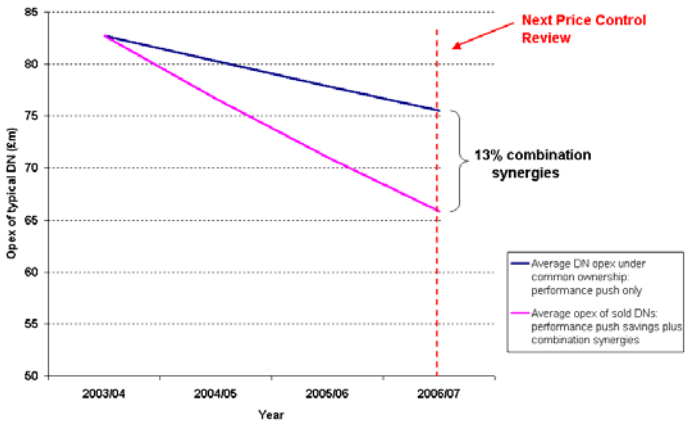
- performance push savings, which are a function of the quality and focus of the management team as well as the starting quality, efficiency and capabilities of the acquired business: these savings typically amount to approximately 10-13% of the DN controllable opex; and
- combination synergies, which are a function of the economies of scale, and the economies available from the elimination of geographic and skills overlap between the two merger parties: these savings are not accessible to NGT, and typically amount to approximately 9-13% of the DN controllable opex.

These findings are consistent with evidence collected for a range of UK mergers in electricity and water distribution:

1. Accenture experience in UK utility M&A suggests a potential level of savings in a range from 20 to 30% of the controllable operating cost of the target;
2. External market analysis of actual UK utility mergers: recent mergers involving DNOs have attracted acquisition premia in a range between 11 and 29% of the Regulated Asset Value of the acquired DNO, which suggests that buyers see significant scope for cost saving synergies in these transactions. This is also consistent with merger cost synergies announced in recent transactions involving DNOs and WaSCs, which have typically ranged between 15 and 30% of the controllable operating costs of the target.

Figure 1 illustrates the likely impact of a sale on the cost base of a DN.

Figure 1: DN opex profile: comparison of common ownership and sales scenario



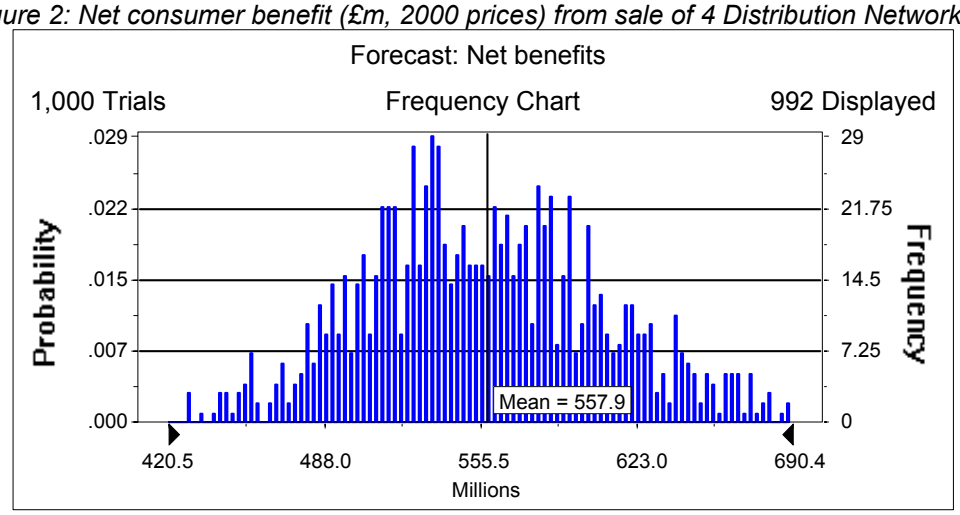
It is important to note that the above savings are all focused on opex, and exclude any benefits that a merger can bring in terms of repex and capex efficiencies.

2.3. Conclusions regarding range of benefits arising from network sales

A Monte Carlo simulation was used to estimate the net consumer benefit arising from DN sales. The approach accommodates multiple variations in assumptions about the starting inefficiency of each DN, efficiency improvements resulting from comparative competition, incremental efficiency improvements due to merger savings, and the costs of delivering DN sales.

On this basis, NGT estimates that the mean value to consumers of the sale of four DNs is **£558 million** (2000 prices). Figure 2 illustrates the range and frequency of the results of the simulation.

Figure 2: Net consumer benefit (£m, 2000 prices) from sale of 4 Distribution Networks



The benefits case is robust not only to variations in the above assumptions, but also to the number of DNs sold, as Table 1 shows.

Table 1: Net consumer benefit (£m, 2000 prices) from sale of Distribution Networks – summary results

		Net consumer benefit (£m, 2000 prices)		
		Min £m	**Mean £m**	**Max £m**
Base case	* 9-13% merger savings in first three years * 4 DNs sold	407	**558**	732
Sensitivity to the level of merger savings	Nil merger savings	255	**356**	475
Sensitivity to number of DNs sold	2 DNs sold	241	**365**	523
	3 DNs sold	364	**478**	631

Given that NGT has indicated that, if DN sales proceed, it intends to sell between two and four DNs, we may conclude that the net benefits for gas consumers will range from £365 million to £558 million (in 2000 prices). Under none of the modelled scenarios was the consumer benefit be less than £240 million.

Full details of assumptions and results are contained in Appendix A.

The above range of consumer benefits appears to be conservative in comparison with the estimates made by the Director General of Water Services (DGWS) in respect of the water industry in England & Wales. In several instances the DGWS has proposed remedies to the

issues which have arisen in the course of discussions on a proposed merger (i.e. measures which he believed would adequately compensate the DGWS for the loss of a comparator). It is possible to take these remedies, proposed to compensate the DGWS for the *loss* of a comparator, and apply them to the gas distribution industry to give an indicative value creation figure for the *gain* of a comparator in the event of a network sale by NGT. Running these calculations[2] indicates that the NPV created by selling an individual gas distribution network is in the order of £550 million to £750 million (see Table 2 below for details).

Table 2: Indicative value creation figures in the event of the sale of a gas DN

	Perpetual loss of revenue (%)	Revenue loss (£m p.a)	NPV of Revenue Loss (£m)
South West + Wessex	15%	69	980
Proposed OFWAT remedy	19%	91	1300
South West + Severn Trent	14%	161	2300
Proposed OFWAT remedy	19%	215	3070
Average Gas DN	**14%**	**34**	**552**
Indicative value creation	**19%**	**47**	**749**

These figures reinforce our view that there is significant value attached to the creation of comparators in the UK gas distribution industry. While the "value loss" figures for South West/ Wessex and South West/ Severn Trent are markedly larger than the "value gain" figures for gas distribution, this is primarily due to the fact that the former figures cover two utiities (i.e. water and sewerage) rather than one. Moreover, it is important to note that the remedies proposed by OFWAT in the cases cited above were developed against the backdrop of a water industry which comprises 10 WaSCs and 13 WoCs in England and Wales. The CC has repeatedly stressed that the smaller the pool of comparators, the greater the value of each individual comparator[3]. This should be borne in mind when considering the implications of the above figures for UK gas distribution.

These higher levels of benefit would be consistent with merger rulings in the water. As Ofgem notes in its Policy Statement: "Detailed analysis carried out in the water sector and considered by the Monopolies and Mergers Commission indicated that the loss of comparator was potentially orders of magnitude higher."

2.4 Benefits to other programmes

NTS Exit Capacity/Interruption and Gas Balancing

In its original consultation document Ofgem outlined a number of arguments for the reform of the existing NTS exit capacity and interruption regime. These were:

- removal of potential cross-subsidies between firm and interruptible customers
- limiting the amount of interruption offered to that actually required by Transco
- increased customer choice in interruptible service offerings
- more accurate investment signals leading to more efficient investment in capacity
- a safer and more secure pipeline system.

Ofgem also noted the issues surrounding gas balancing including the pricing and provision of diurnal storage to distribution networks and raised the possibility of extending of such a service, in time, to create line-pack accounts for shippers

Exit capacity/interruption planning/execution and gas balancing will be among the issues covered by the Offtake Agreement between Transco NTS and the distribution networks.

[2] In this case, we have taken the perpetual revenue loss % figures from the examples cited above, and applied them to an average DN revenue figure (£246.25m - the mean revenue figure of the individual networks) to generate an indicative revenue gain figure for the sale of a DN. We have then calculated an NPV revenue gain figure, using a discount rate of 6.25%.

[3] See both the 2002 Competition Commission Report quotation on p.2 of Appendix C, and p.43 of the 1995 Competition Commission report on Northumbrian, where it is stated that "to the extent that each loss of a comparator makes the task of the regulator more difficult, the detrimental impact upon his ability to make comparisons is likely to increase with each loss of comparator".

The creation of this Agreement will be a major contribution to any debate in these areas as it will force Transco to specify, under industry scrutiny, exactly where responsibility lies in decisions for exit capacity/interruption planning/execution and for gas balancing decisions. This should improve the quality of debate around the issues as well as producing more durable long term solutions.

Third-party ownership of some of the distribution networks will contribute in two further ways:

- It will introduce independent and knowledgeable third parties into industry discussions with Transco regarding decisions in these areas. This will, as a minimum, increase confidence in the decision making process, and may improve the quality and consistency of those decisions.
- It will also introduce new management teams with a new commercial focus. They will be motivated to use their assets to develop service enhancements which appeal to shippers (e.g. temporary gas storage).

NGT has not attempted to value these benefits as some of them will only arise in the longer term. However, it is reasonable to assume that they will make a positive contribution towards investment efficiency and system security over time.

Supply Point Administration

In its consultation document Ofgem raises a number of concerns in this area including:

- avoiding market fragmentation, particularly regarding processes operated by shippers
- overcoming barriers to making processes more responsive to customers

NGT's proposal of establishing a Uniform Network Code and retaining existing systems seeks to address the first of these issues.

The second is, at least partially, addressed by its proposal to establish the Agency which would be owned jointly by all Uniform Network Code gas transporters and would act as sub-contractor to them for the operation of their supply point administration and billing activities.

This proposal benefits consumers in a number of ways:

- a new set of owners and customers will apply pressure to the Agency to reduce costs and improve performance in a way that an independent regulator cannot;
- it will require clear accountability to be established between the Agency and the networks for different parts of the supply point administration and billing processes;
- establishing an incentive regime for Agency management which is clearly tied to delivery of the industry agreed service standards.

The problem of making processes more responsive to consumers goes wider than NGT and brings into play a range of issues such as:

- improving customer switching between suppliers;
- establishing incentives to improve and develop supply point administration services; and
- moving iGTs to common supply point administration systems.

NGT is keen to continue discussing how it can help in these complex policy areas.

3. NGT's evaluation of the external costs of network sales

NGT estimates that incremental non-NGT costs of DN separation and sale over and above the introduction of separate price controls lie in the range £10 million to £18 million (in 2000 prices), made up as follows:

Cost area	Cost range
Changes to shipper/supplier systems	£8m - £16m
Specifying and drafting changes to regulatory and commercial frameworks	£3m - £4m
Incremental shipper/supplier operating costs	neg.
Incremental costs of regulating multiple networks	neg.
Acceleration of diverging prices across regions	neg.
NGT's loss of economies of scale	not applicable
Total external costs	£11m - £20m
Total external costs (in 2000 prices)	**£10m - £18m**

3.1 Changes to shipper/supplier systems

NGT has estimated the cost for the shipper community to modify their payment and invoicing systems and their associated back office systems to be £8m-£16m. The £16m maximum cost is conservatively estimated by assuming that the effort required by the 12 largest shippers will be equivalent to NGT's effort to change their own associated systems and the manday cost applied is based on externally sourced resources as opposed to potentially lower cost in-house resources. A comprehensive explanation of the basis for this estimate is contained in Appendix B.

3.2 Specifying and drafting changes to regulatory and commercial frameworks

A great deal of commercial discussion, legal drafting and review will be required to develop these proposals.

The main industry documents for development are the GT licences, the Uniform Network Code, and the framework/accession agreements signed by parties to the UNC. In addition, we would expect industry players to review the detail of the Offtake Agreement.

On top of this the GT licence will need to be developed and there will be consultation documents to draft and review.

NGT's own estimate for its legal and commercial resource to develop and draft these documents is around £1m. These costs will be borne by NGT but the figure provides a useful benchmark for the costs of others.

Excluding NGT, we would anticipate Ofgem's effort to be the most considerable and estimate £1m, in line with our own expected expenditure. We believe that £2m to £3m in total should cover the commercial and legal effort of other industry players.

NGT has therefore included estimates of between £3m and £4m in its cost modelling.

3.3 Incremental shipper/supplier operating costs

Initial comments on the original consultation document appear unanimous in advocating a "minimum change" approach to administrative systems.

In 3.1 we discussed our estimate of the costs of implementing system changes to support separate network ownership. We believe that once these changes are implemented the additional operating costs will be negligible and have included no costs in our modelling.

3.4 Incremental costs of regulating multiple networks

It is possible to take a range of views on the costs and benefits for the regulator of dealing with multiple networks.

In the first instance, with separate price controls already established, it is unlikely that the regulator will need to deal with large amounts of incremental data as a result of networks passing into separate ownership.

In the longer term, comparative regulation of separately owned networks should generate much of the data needed to regulate each of the networks, reducing the need to rely on efficiency consultants at future price reviews.

On the other hand, multiple licence holders are likely to generate more issues requiring regulatory review on an ongoing basis.

Ofgem may be able to draw on comparisons between gas and electricity regulation in estimating this component of costs (or indeed with Ofwat's costs of regulating the water industry) but, at this stage, we believe the additional costs are likely to be *de minimis*.

3.5 Acceleration of diverging prices across regions

While the sale of networks builds on the separate price controls work due for completion in April 2004, some commentators have offered the view that separate ownership will lead to faster price divergence – bringing forward significant system costs and increasing customer confusion.

NGT believes that "sculpted" regulatory asset values that essentially establish common starting prices which evolve under comparative competition will provide sufficient incentives for networks to strive to be the most efficient network and, should they lose that position, to work hard to retain it.

We would note that electricity supply competition operates successfully in an environment with considerable historic price divergence. Hence we do not think it necessary to include any costs for this in our analysis.

3.6 NGT's loss of economies of scale

NGT's decision to offer networks for sale has had to take account of the impact on our own economies of scale. We do not expect to be offered compensation for any loss of these economies at future price reviews but are confident of continuing to reduce our costs for a number of reasons:

- following any sales we will retain substantial economies of scale from the ownership of the retained distribution networks, Transco's NTS, NGC and our substantial US operations.
- Comparative competition will ensure that we are incentivised to keep a leading position across our operation
- A smaller scale gas distribution business will be able to access some savings which are not available at a national scale.

Ultimately NGT bears this risk in the first instance through the price review mechanism and we would not commit to sales if we were not confident of meeting the challenge. We have included no costs in our estimates.

3.7 Safety

Some commentators have suggested that consumers and the general public could suffer costs in the form of reduced levels of safety and reliability as a result of sales.

There are statutory protections: sales will not be completed unless Transco and the buyers have satisfied the HSE that the resulting operations are at least as safe as today and the HSE has accepted revised safety cases submitted by Transco and the buyers.

We can also be confident that buyers will not wish to risk their corporate reputation by buying a gas distribution business unless they are confident of their ability to operate it safely.

In the longer run, new management teams will start to look at their approaches to safety and, within the operation of the statutory framework, we can expect to see different approaches to

safety issues emerging over time. This is likely to drive up safety standards all round. We have included no costs in our estimates.

4. Conclusion

In conclusion, NGT believes that the creation of comparators in gas distribution would generate a significant net benefit for gas consumers, conservatively estimated at between £365 million - £558 million (in 2000 prices). This benefit is over and above any benefits arising from the introduction of separate price controls and is generated from merger savings available to utility buyers in the period immediately after acquisition, and the impact of comparative competition between separately owned companies in perpetuity.

NGT believes that there is a strong case for the Authority to continue to devote resources to working with NGT and the industry to create an acceptable industry architecture to allow separation towards the beginning of the fourth quarter of 2004.

Appendix A: Consumer Benefits Modelling

Executive Summary

Given that NGT has indicated that, if DN sales proceed, it intends to sell between two and four DNs, we conclude that DN sales would deliver between **£365 million** and **£558 million** in net consumer benefits.

A Monte Carlo simulation was used, in order to accommodate multiple variations in assumptions about the starting inefficiency of each DN, efficiency improvements resulting from comparative competition, incremental efficiency improvements due to merger savings, and the costs of delivering DN sales.

NGT estimates that the mean value to consumers of the sale of 4 DNs is £558 million (2000 prices). As the results show, the benefits case is robust not only to variations in these assumptions, but also to the number of DNs sold:

Number of DNs sold	Consumer benefit (mean)
4	£558 million
3	£478 million
2	£365 million

Assumptions

Table 1 details the model's assumptions, which are discussed below.

Table 1: Assumptions

Regulatory periods modelled		**2004-2007**	**2008-2012**	**2013-2017**	**2018-2022**
Range of observed inefficiency of firms at start of period		Each DN: between 0% and 30% inefficient (2004 opex). uniform distribution	Determined by opex reduction versus starting inefficiency in previous period	Determined by opex reduction versus starting inefficiency in previous period	Determined by opex reduction versus starting inefficiency in previous period
Efficiency improvement for DNs as a result of comparative competition (per annum) normal distribution, 2% variance					
Sold DNs	invariant to number sold	4.3%	4.3%	4.3%	4.3%
Unsold DNs	where 0 DNs sold	3.0%	3.0%	3.0%	3.0%
	where 1 DN sold	3.4%	3.4%	3.4%	3.4%
	where 2 DNs sold	3.7%	3.7%	3.7%	3.7%
	where 3 DNs sold	3.9%	3.9%	3.9%	3.9%
	where 4 DNs sold	4.0%	4.0%	4.0%	4.0%
	where 5 DNs sold	4.1%	4.1%	4.1%	4.1%
	where 6 DNs sold	4.2%	4.2%	4.2%	4.2%
	where 7 DNs sold	4.3%	4.3%	4.3%	4.3%
Incremental efficiency improvement in sold DNs in first three years owing to merger savings uniform distribution within range					
Range for sold DNs	High	13% (4.3% pa)	not applicable	not applicable	not applicable
	Low	9% (3% pa)	not applicable	not applicable	not applicable
Comparative regulation assumptions					
Efficiency frontier set by *n*th most efficient firm where *n* =		not applicable	1	1	1
Frontier shift		not applicable	0%	0%	0%
Frontier time to catch up (years)		not applicable	5	5	5
Frontier catch-up rate	where 0 DNs sold	not applicable	0.0%	0.0%	0.0%
	where 1 DN sold	not applicable	37.5%	37.5%	37.5%
	where 2 DNs sold	not applicable	50.0%	50.0%	50.0%
	where 3 DNs sold	not applicable	62.5%	62.5%	62.5%
	where 4 DNs sold	not applicable	75.0%	75.0%	75.0%
	where 5 DNs sold	not applicable	75.0%	75.0%	75.0%
	where 6 DNs sold	not applicable	75.0%	75.0%	75.0%
	where 7 DNs sold	not applicable	75.0%	75.0%	75.0%
	where 8 DNs sold	not applicable	75.0%	75.0%	75.0%
Discount rate		6.25%	6.25%	6.25%	6.25%
Control case		No sales	-	-	-
DN sales (base case)		Sale of 4 DNs occurs in 2004	-	-	-
Number of comparators (base case)		5	5	5	5
Costs Uniform distribution within range £10.0m to £18.0m					
Note on modelling With the exclusion of the 2008-2012 period, where the catch-up targets for all DNs take account of the incremental merger savings achieved by the sold DNs, the modelling ensures that overall allowed opex does not decrease at a faster rate than underlying efficiency improvements in the DNs.					

The rationale for the assumptions and approaches followed are as follows:

1. Periods modelled

The model runs from 2004 to 2022. This comprises the remainder of the current price control period and the three successive five-year price control periods.

2. Sale scenarios

As discussed in the main body of the paper, NGT has indicated that, if DN sales proceed, it intends to sell between two and four DNs. Other scenarios are therefore not modelled. The sale of DNs is assumed to take place in 2004.

3. Starting inefficiency of DNs

We assume that the choice of DNs to be sold is made independently of their efficiency. This is consistent with NGT's current approach, namely managing the potential sales process according to buyer interest. Three DNs have already been removed from the process.

4. Efficiency improvement as a result of comparative competition

In a no-sales scenario, we assume that DNs deliver efficiency improvements equivalent to 3% per annum. Sold DNs deliver 4.3% pa owing to their immediate need to compete (in line with Ofgem's assumption). NGT believes that, in a competitive scenario, it will wish – and be able – to match this target. Nonetheless, having listened to the comments of several industry participants, we have taken a significantly more conservative approach in the model. Retained DNs are assumed to deliver opex reductions of between 3% and 4.3% per annum, depending on the number of DNs that have been sold, reflecting the increase in competitive pressure as the number of comparators increases.

5. Incremental efficiency improvement in sold DNs in first 3 years owing to merger savings

Analysis conducted for NGT by Accenture (made available confidentially to OFGEM) refers to the combination synergies which are available to trade buyers of a DN. Under the present industry structure, these synergies are not currently accessible, and so cannot be passed on to consumers. We have assumed that these merger savings will lead to additional opex reductions in the sold DNs of between 9% and 13% (uniform distribution) across the first three years.

6. Comparative regulation assumptions

At the end of each regulatory period, the efficiency frontier is set by the most efficient firm. In our base case of four DN sales, we assume that the regulator requires all firms, by the end of the new regulatory period, to have closed 75% of its gap from the frontier. This matches Ofgem's approach in its treatment of the electricity DNO sector, in which there are at least five comparators. Where fewer than four DNs have been sold and there are therefore fewer than five comparators, we have assumed that Ofgem have less confidence in the comparative data and therefore set a less aggressive catch-up rate, reducing to zero in a scenario of no DN sales. Our catch-up duration of five years is notably more conservative than the current Ofgem practice of 3 years for electricity DNOs. Taken together, therefore, the rate of catch-up could be considered conservative. Furthermore, the model is constructed in such a way that the total of allowed opex for all 8 DNs never decreases at a rate which is faster than the underlying efficiency improvements in the DNs. This excludes the 2008-2012 period, where the catch-up targets for all DNs take account of the incremental merger savings achieved by the sold DNs.

7. Costs

The costs to the industry of delivering DN sales are assumed to be between £10m and £18m (uniform distribution).

Throughout the modelling, all financial information is quoted in 2000 prices.

The primary advantage of the Monte Carlo simulation approach is that it models the following input variables in multiple combinations under specified distributions and ranges:

- Starting inefficiency of each DN, ranging from 0% to 30%
- Efficiency improvement as a result of comparative competition
- Incremental efficiency improvement owing to merger savings
- Costs

Results

Based on the Monte Carlo simulation, we conclude that the net present value of the net consumer benefit resulting from the sale of four Distribution Networks (the base case) is £557.9m.

The range and frequency of the net consumer benefit is shown in Figure 1.

The consumer benefits remain robust even in the most conservative scenario, where we may assume that each input variable is modelled from the least beneficial end of its range[4], yields a positive net consumer benefit of **£406.7m** (an outlying result on Figure 1)**.** Importantly, the multiple trial approach of Monte Carlo simulation is able to demonstrate that such benefits are deliverable even if the DNs sold were the least efficient.

Benefits range up to a maximum of **£732.3m.**

Figure 1: Base case – sale of 4 Distribution Networks

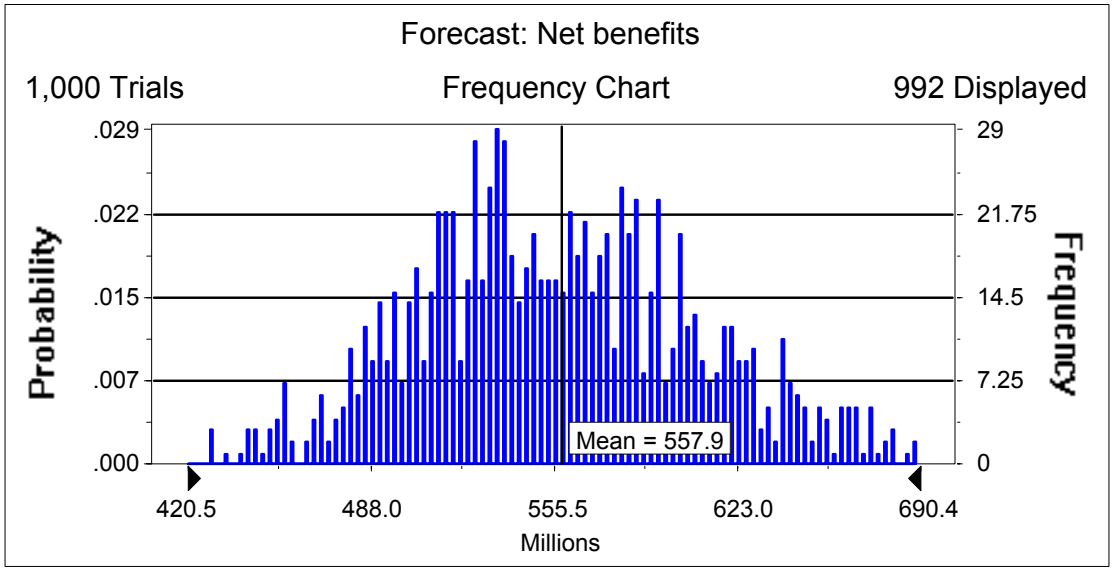


Table 2 (see p.6) summarises the results obtained from the model.

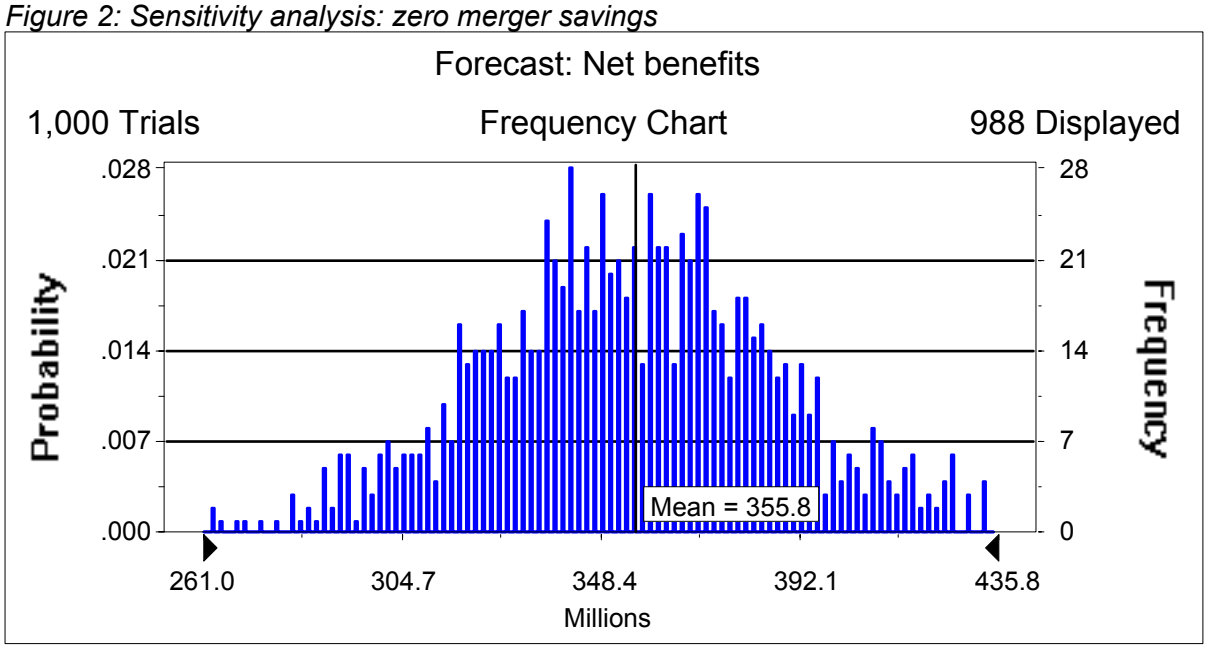
[4] Namely:

- Starting inefficiency of each DN: sold DNs are the four most inefficient, each with inefficiency near 30%
- Efficiency improvement as a result of comparative competition: 3.9% pa for sold DNs, 3.6% for unsold DNs
- Incremental efficiency improvement owing to merger savings: 3.0% pa
- Costs: £10 million

Sensitivities

The base case model is tested for its sensitivity to the level of incremental efficiency improvements arising from merger savings, which are assumed to lie in a range of 9% to 13% over the first three years. Adjusting the merger savings to zero reduces the net consumer benefit NPV to **£355.8m** as illustrated in Figure 2.

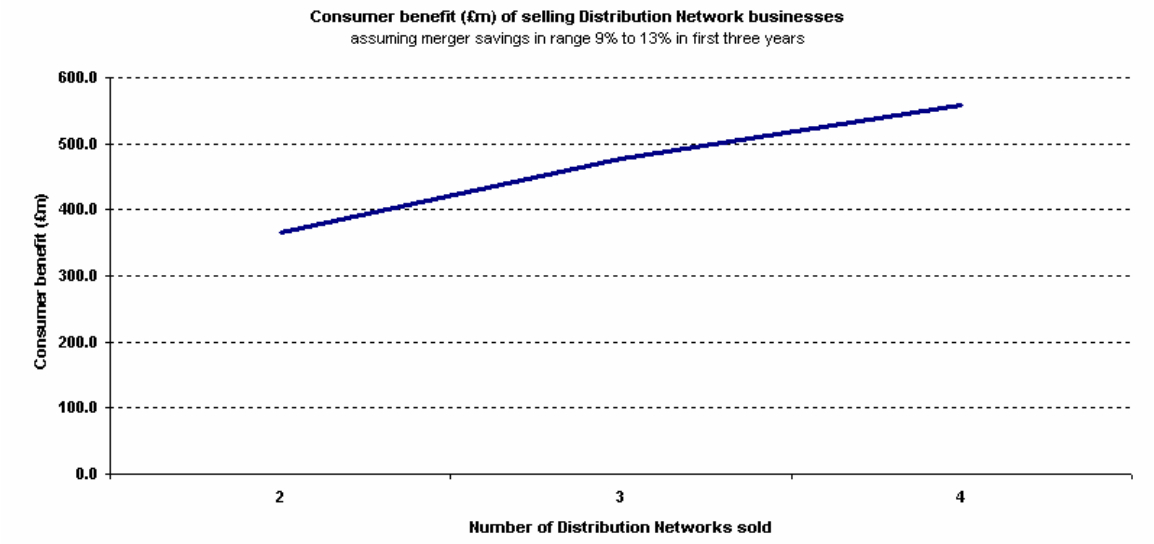
Figure 2: Sensitivity analysis: zero merger savings



The chart illustrates that the consumer benefits case is robust even to the assumption of zero merger savings coupled with the most conservative modelled combination of input variables; in this scenario, at least **£255.0m** net consumer benefit would be delivered.

Sensitivity to the number of Distribution Networks sold is then tested. The results are displayed in Figure 3.

Figure 3: Sensitivity of base case to number of DNs sold and level of merger savings



Since NGT does not intend to sell fewer than two DNs, an average of at least **£365.4m** (NPV) in consumer benefit would be delivered if DN sales were to take place.

Figure 4: marginal consumer benefit of each additional Distribution Network sale

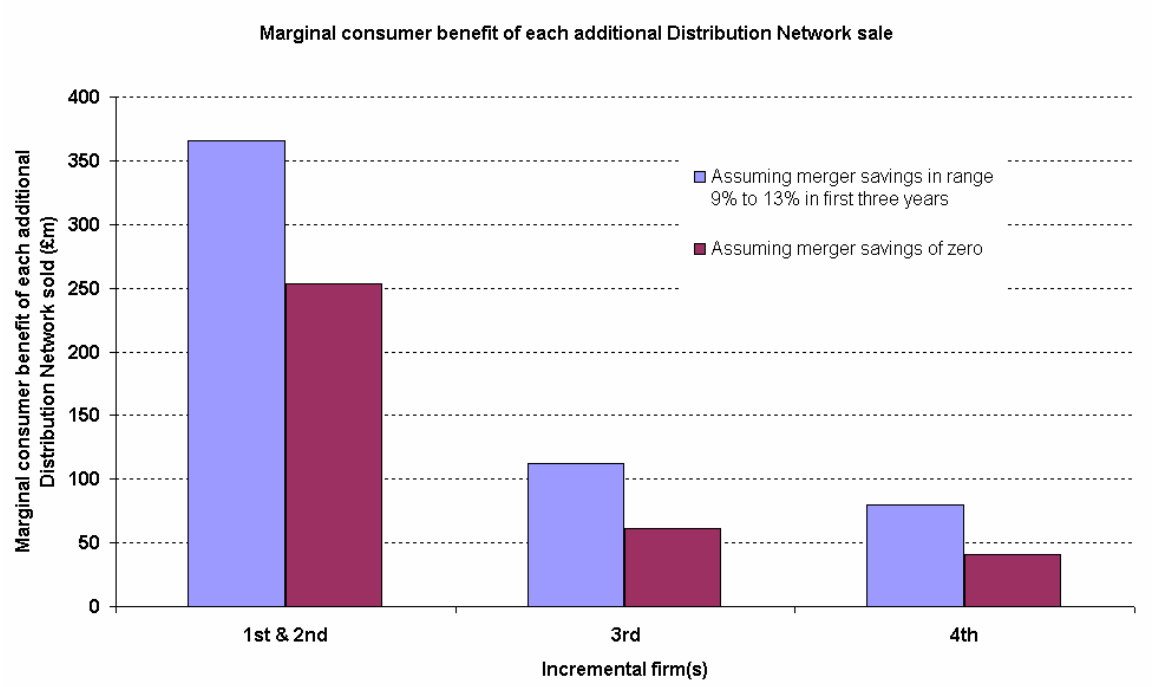


Figure 4 illustrates the significant value that the creation of comparative competition has for consumers, and is consistent with Ofwat's and the Competition Commission's views that the value of each comparator increases as the number of independent comparators decreases.

Table 2: Summary of results

		Net consumer benefit (£m, 2000 prices)		
		Min £m	**Mean £m**	**Max £m**
Base case	* 9-13% merger savings in first three years * 4 DNs sold	407	**558**	732
Sensitivity to the level of merger savings	Nil merger savings	255	**356**	475
Sensitivity to number of DNs sold	2 DNs sold	241	**365**	523
	3 DNs sold	364	**478**	631

Appendix B: Shipper Change Impact Estimation

Executive Summary

NGT has estimated the cost for the shipper community to modify their payment and invoicing systems and their associated back office systems to be £8-16m. The £16m maximum cost is conservatively estimated by assuming that the effort required by the 12 largest shippers will be equivalent to NGT's effort to change their own associated systems and the manday cost applied is based on externally sourced resources as opposed to potentially lower cost in-house resources.

Basis of the analysis

In assessing the impact on shipper systems, the shipper community was subdivided into three main categories based on the size of their supply point portfolio size:

- Large Shippers – portfolio size greater than 100,000 supply points
- Medium Shippers – portfolio size 10,000 - 100,000 supply points
- Small Shippers – portfolio size <10,000 supply points

For each of the three categories of shipper size, the cost and effort to change the invoice and payment systems as a result of network sales is assessed and aggregated to determine the overall cost to the shipper community. The analysis is based on the assumption that the total effort required to change a shipper system will vary primarily as a function of the shipper's supply point portfolio size. The larger the portfolio size, the greater the effort required for changing the supporting systems. As most of the major systems for this activity are bespoke tailored systems, it is difficult to estimate a specific manday effort to change the systems. Hence, we have adopted a conservative approach and assessed that the manday effort required for large shippers is 80-100% of the effort required by NGT to change its associated billing and payment systems.

NGT's assessment of the likely scope of change required for each shipper category is as follows:

Required changes for Large Shippers

- Invoice Loading Routine and File Format Validation Routine.
- Invoice Validation routine - validating the summary charge to the detailed charge items.
- Changes to the charge item validation process
- Changes to the process used to identify problematic charges/supply points.
- Interfaces with a back-office payment system.
- Changes to the back-office system, to allow for payment of multiple invoices.

Required changes for Medium Shippers:

- Invoice Loading Routine
- Invoice Validation routine - validating the summary charge to the detailed charge items.
- Changes to semi-automated process used identify problematic charges.
- Interfaces changes with a back-office payment system.
- Changes to the back-office system, to allow for payment of multiple invoices.

Required changes for Small Shippers: (portfolio size greater than 200 but less than 10,000)

- Simple Invoice load and validation routine.
- Invoice Validation process.

It is assumed that very small shippers (portfolio size less than 200) will have minimal automated changes. Using the above assumptions it has been estimated that the percentage of NGT effort required to change shipper systems will be 80-100% of associated NGT manday effort for large shippers, 33-66% of associated NGT manday effort for medium shippers, and 10-15% of NGT effort for small shippers. Using an average IT contractor rate of £490 to £660 per day, and the current estimate to change NGT Invoice systems of 239 man-weeks, the costs for the different category of shipper was then calculated.

In addition to the main invoicing and payment system changes, it has been assumed that only large and medium size shippers will have an integrated back-office system. It is estimated that the effort required to change these systems will be between 50 -100 man-days effort per shipper.

Conclusions regarding cost range

Based on the approach outlined above the range of costs based is estimated at £8.2m to £16m for the total shipper community with an average cost per shipper of between £216k - £430k. The split of average cost per shipper for each group is shown below:

Large Shippers (Total = 12)
Average Cost Per Shipper: £495,000 - £855,000
Intermediate Shippers (Total = 7)
Average Per Shipper: £219,000 - £587,000
Small Shippers (Total = 12)
Average Cost Per Shipper: £58,500 - £126,200

1. Introduction

The purpose of this document is to provide an indicative estimate of the potential impact to shippers resulting from the changes made to 'Agency' systems arising from the requirements for network sales.

The costs are estimated by sub dividing the shipper community into three main categories based on the size of the shipper's portfolio of supply points. For each of the three categories of shipper size, the cost and effort to change the invoice and payment systems as a result of network sales are assessed and aggregated to determine the overall cost to the shipper community. The analysis is based on the assumption: that the total effort required to change a shipper system will vary primarily as a function of the shipper's supply point portfolio size. The larger the portfolio size, the greater the effort required for changing the supporting systems. As most of the major systems for this activity are bespoke tailored systems, it is difficult to estimate a specific manday effort to change the systems. This paper describes in detail the methodology used by equating the required work to the associated changes required to NGT systems and illustrates the analysis that has been carried out to assess the overall cost to the shipper.

2. Generic Aspects

2.1 Scope

The document provides an indicative estimate of the potential impact to shippers, resulting from the changes made to 'Agency' systems required following completion of network sales.

The assessment of impact is provided in terms of and indicative cost and/or an estimate of the effort required for implementing shipper system changes.

Only those 'Agency' changes that have a direct impact on shipper systems are considered, and changes that have a consequential or indirect affect are out of scope.

For the purposes of this document only shippers with 'live' confirmations registered on the UKLink Sites and Meters database (as at 29/10/2003), have been considered when estimating total community costs.

2.1.1 Included

Based on the high level analysis undertake, the following system changes have been identified as having a potential impact:

- Billing Changes
- Associated back office system changes

2.1.2 Excluded

Only those 'Agency' changes that have a direct impact on shipper systems are considered, and changes that have a consequential or indirect affect are out of scope.

Changes to business process that result from Agency changes have not been considered.

The following changes may impact shipper systems; however any associated shipper changes are likely to be minor.

- SPA File Format changes *(this proposal is unlikely to occur)*
- Pre-Termination Sanctions – on the assumption that a new rejection code is implemented (*again this change is unlikely*).
- M Number CD – The proposed changes is to separate Network Operator Data on to distinct CD – no data structure changes are envisaged.

2.2 Generic Assumptions

1. Shippers are unlikely to have an offshore software development (ODC) arrangement although a limited number may; others will be exposed to UK Contractor Rates.

2. Indications are that Shippers do not use common industry systems to process and validate NGT invoices. The majority (if not all) use bespoke systems.

3. There is no industry standard effort or cost estimation models, for assessing the impact to an unknown bespoke system.

4. An assumed average daily rate for a UK IT contractor is £490 (min) to £660 (max). This is based on a blended IT Development resource rated, based on a combination of:
   - Project Manager: 800 – 1000 (weighting x 1)
   - Developer: 500 – 700 (weighting x 3)
   - ODC Offshore: 150 – 200 (weighting x 1)

5. The total effort required to change shipper systems will vary primarily as a function of portfolio size. The assumption being that the larger the portfolio, the more complex the associated supporting systems.

6. Only shippers with 'live' confirmations registered on the UKLink system will be affected by the proposed Agency day one changes.

7. No individual shipper will require greater effort than NGT, to amend their associated invoice validation and payment systems.

8. The effort required to change an individual shippers system can be represented as a proportion or percentage of NGT's estimated effort.

2.3 Billing Changes: Impact Assessment

2.3.1 Assessment of Shipper Systems

- Shippers do not use any Industry Standard systems to validate NGT invoices. The majority (if not all) shipper use bespoke in-house systems.
- The level of complexity functionality & automation of systems varies enormously between shippers. With larger shippers employing complex validation and verification routines, whereas smaller shippers may just print, manually verify and pay NGT invoices.
- Based on information provided by Shipper Services customer advocates and Billing staff. Shippers Invoice validation and payment systems, can be broadly categorised into three areas:
  - Complex
  - Intermediate Complex
  - Simple
- A number of the smaller shippers may not employ any IT systems to manage the validation or processing of their invoices:
  - Manually Processed

Complex systems will tend to have the following functionality:
- Invoice Load and File Validation Routine
- Invoice Validation and Charge Verification Routines
- Process to identify problematic supply points (duplicate meters etc.)
- Payment withholds process to withhold disputed amounts.
- Possible interface with meter read systems and portfolio management systems.
- Interface with 'back-office' payment and financial reporting system

Complex systems will tend to be based around large industry standard database (Oracle, DB2) with the possibility of online user access.

Intermediate systems will tend to have the following functionality:
- Invoice Load Routine
- Invoice Validation Routine (validate summary charges against detailed charge items).
- Manual or semi-automated process to identify problematic supply points (duplicate meters etc)
- Manual or semi-automated payment withholds process to withhold disputed amounts.
- Interface with 'back-office' payment system or department.

Intermediate systems will tend to be based around small industry standard database (MS Access) or even complex spreadsheets. They may undertake similar functions complex systems, but with much less automation and complexity.

Simple systems will tend to have the following functionality:
- Simple load routine
- Simple or Manual Invoice validation, or simple validation via a spreadsheet.

- Manual identification of problematic supply points.
- Manual payment withholds process.
- No interface with payment system.

Simple systems may be a small database or spreadsheet, with the majority of validation processes and associated payment processes being undertaken manually.

As at the 29/10/03 there are a total of 44 distinct shippers will live confirmations registered on the UKLink Sites & Meters database. These shippers can be grouped into the following categories:

- Large: portfolio size greater than 100,000 supply points (SP)
- Medium: portfolio size greater than 10,000 SP but less than 100,000 SP
- Small: portfolio size less than 10,000 SP.
- Very Small: portfolio size less than 200 SP

Portfolio Size	Shipper Count
Large (>100,000)	13
Medium (<100,000 but >10,000)	8
Small (>10,000)	13
Very Small (>200)	10
TOTAL	44

Over the past 4 – 5 years there have been a number of mergers and buy-outs within the shipper community. This has resulted in one company 'owning' a number of shipper portfolios. For example, the Powergen Group has the following shipper portfolios: Powergen Retail, Powergen Gas Limited, East Midlands & TXU.

For the purposes of the document it has been assumed that where a single company owns more than one 'shipper portfolio', they will employ a single back-end invoice validation and payment system.

Unfortunately, work to assess how shipper portfolios related to parent 'owning' companies has not been undertaken. However it is being assumed that the above will reduce the overall number of shipper systems by up to 10%.

By using the above assumption, and by using the portfolio size as an indication of the type of supporting systems, it can be assumed that in the shipper community there may currently be:

- 12 complex systems
- 7 systems of intermediate complexity
- 12 simple systems
- 10 manually processed

2.3.2 NGT 'Agency' - Billing Changes

Based on generic assumption number 2, we have estimated that the following interface changes may result:

- Possible creation up to 6 new file types – to accommodate each the new summary 'thin' invoices, one for each invoice type. Current assumption is that the following invoice files will be affected:
  - Commodity
  - Capacity
  - Commodity Adjustment
  - Capacity Adjustment
  - Adhoc
  - Reconciliation

- Possible creation of new record types to support the thin summary invoices.
- Change to the Invoice Summary records in the supporting file (backup file). At the very least Invoice details (Transco account details, VAT number) will be removed from the backup file.
- New records or data fields in the supporting file (backup file) to provide a link to the 'thin invoice'. Allowing shippers to reconcile the charge items against the summary 'thin invoices'.
- Split10ting of the TRE charge item into component parts (LDZ, NTS, Customer) in the supporting file.
- Splitting of the RBT and RCT charge into component parts (LDZ, NTS, Customer) in the supporting file.

** Splitting the reconciliation charge pre and post disposal date has not been considered.

2.3.3 Assessment of Impact to Shipper Systems

2.3.3.1 Invoice System Impacts

As describe in section 2.3.1, shipper systems can be broadly grouped in to one of three categories:

- Complex
- Intermediate
- Simple

Based on the effort estimated by NGT IS for changes to:
Invoicing '95 = 84 weeks
Billing 2000 = 135 weeks
CSEPs & Unique Sites = 20 weeks
Total = 239 weeks

Based on this total, the worst-case assumption is that shippers with complex systems will incur at most 100% of the effort required to change to NGT invoice system (i.e. 239 wks).

Shippers with Simple and Intermediate systems will incur a portion of that effort based on the number of process they require changing – as detailed in the table below.

Table below is shown with an average contractor rate of £660 per day. (Assumption 5)

	Shipper Systems		
Process	**Simple**	**Intermediate**	**Complex**
Invoice load and file validation routine	X (50%)	X	X
Invoice validation and charge verification	X (50%)	X	X
Process to identify problematic supply points	N/A	N/A	X
Payment withold process to withold disputed amounts	N/A	X	X
Interfaces with meter reading and portfolio management systems	N/A	N/A	X
Interfaces with "back-office" payment and financial reporting system	N/A		X
Percentage of NGT effort	16%	66%	100%
Days effort x UK market rate of £660 per day	£126,912	£520,542	£788,700
Number of shippers	12	7	12
Cost x number of shippers	£1,514,304	£3,643,794	£9,464,400
Total cost to shipper community for billing changes	£14,622,500		
Average cost per shipper	£471,700		

Table below is shown with an average contractor rate of £490 per day (Assumption 5):

Percentage of NGT effort	16%	66%	100%
Days effort x UK market rate of **£490** per day	£93,688	£386,463	£585,550
Number of shippers	12	7	12
Cost x number of shippers	£1,124,256	£2,705,241	£7,026,600
Total cost to shipper community	£10,857,000		
Average cost per shipper	£350,200		

The scenarios detailed below assume that shippers incur a low percentage of NGT – Agency Billing changes. The assumption is based on the fact that there is a great amount of variability between shippers invoice validation systems. The assumption below would represent a lower cost scenario.

Table below is shown with an average contractor rate of £660 per day.

Percentage of NGT effort	10%	33%	80%
Days effort x UK market rate of **£660** per day	£78,870	£260,271	£630,960
Number of shippers	12	7	12
Cost x number of shippers	£946,500	£1,821,900	£7,571,500
Total cost to shipper community	£10,339,900		
Average cost per shipper	£333,500		

Table below is shown with an average contractor rate of £490 per day.

Percentage of NGT effort	10%	33%	80%
Days effort x UK market rate of **£490** per day	£58,555	£193,250	£468,500
Number of shippers	12	7	12
Cost x number of shippers	£702,500	£1,352,500	£5,621,300
Total cost to shipper community	£7,676,500		
Average cost per shipper	£250,000		

2.3.3.2 Back Office System Impacts

It is assumed that shippers with both intermediate and complex systems will have an automated Back-Office payment system, and that both will incur additional with regards to changing their back-office system.

The assumed changes are:

- The creation of up to 4 new accounts payable.
- The extension of the 'payment withhold' process to each of these accounts payable.
- Amendments to financial reporting.

It is assumed to be between 50-100 man-days effort will be required to support the back-office system changes:

This may equate to an additional cost across the shipper community of

For an average contractor rate of £490 per day, a range between £514,500 - £1,029,000
For an average contractor rate of £660 per day, a range between £693,000 - £1,326,000

2.4 Summary of Estimated Costs to the Shipper Community

Table below based on the higher percentage of NGT Effort per Shipper.

	Blended Contractor Rate	
	£490	**£660**
Estimated total cost to shipper community for invoice system changes	£10,856,000	£14,622,500
Estimated total cost to the shipper community for back office system changes	£1,029,000	£1,386,000
Estimated total cost	**£11,885,000**	**£16,010,000**
Average cost per shipper (based on 31 active shipper companies)	£315,629	£428,136
Estimated total effort main days	24,000	24,000

Table below based on the lower percentage of NGT Effort per Shipper

	Blended Contractor Rate	
	£490	**£660**
Estimated total cost to shipper community for invoice system changes	£7,676,500	£10,339,000
Estimated total cost to the shipper community for back office system changes	£514,500	£693,000
Estimated total cost	**£8,200,000**	**£11,030,000**
Average cost per shipper (based on 31 active shipper companies)	£216,000	£290,000
Estimated total effort main days	17,000	17,000

3. Conclusion

The total cost to the shipper community is estimated at a maximum of £16m taking the conservative view that the changes required by the shippers will be equivalent to the associated changes in NGT.

Appendix C: Comparator Valuation in the UK Water Industry

Introduction

The purpose of this appendix is to provide OFGEM with an overview of how the value of comparators has been assessed in the water industry, and to consider the implications of this for NGT's proposed sale of gas distribution networks. This appendix will:

- describe the background to comparator valuation in the UK water industry;
- assess how different comparator valuation techniques have been applied in four separate case studies since 1995; and
- assess the implications of UK water industry practice and precedents for NGT's proposed sale of gas distribution networks.

Executive Summary

Since 1989, the Office of Water Services (OFWAT) has developed a comparative regulatory regime to drive performance improvements in the regulated water and sewerage companies of England and Wales. In order to protect the efficacy of this regime, all except the smallest proposed mergers in the industry are referred to the Competition Commission (CC) under the 1991 Water Industry Act. This provision safeguards the ability of the Director General of Water Services (DGWS) to draw comparisons between companies in order to carry out his duties in an industry where there is little direct competition. This would be prejudiced by the loss of a comparator. Unless the prospective savings from a merger are sufficient to be of "substantially greater significance in relation to the public interest" than the value of the loss of a comparator to the DGWS, the CC will either suggest possible remedies or will recommend that the merger be prohibited. In order to reach a conclusion on the desirability of prospective mergers, therefore, the CC has had to address the issue of how to value the loss of a comparator.

For the purposes of this paper, we have reviewed four separate mergers which have been proposed since 1995:

- Lyonnaise des Eaux (NEW)/ Northumbrian Water Group (1995);
- Wessex Water/ South West Water (1996);
- Severn Trent/ South West Water (1996); and
- Vivendi Water UK/ First Aqua (Southern) (2002).

For each of these proposals, a number of different bodies made submissions to the CC which sought to quantify the impact of the loss of the relevant comparator to the UK water industry (full details of these submissions are provided in the main body of this appendix). In several instances, the DGWS also proposed remedies to the issues which arose in the course of discussions on a proposed merger (i.e. measures which he believed would adequately compensate the DGWS for the loss of a comparator). To take two examples:

- For the proposed merger of Wessex and South West, the DGWS suggested price reductions across the merged entity towards the bottom of the 15-20% range. This equated to reduction in revenue of £69 million to £91million a year (£980 million to £1,300 million NPV, at a discount rate of 7% in perpetuity)[5].

[5] *Wessex Water and South West Water: A report on the proposed merger*, CC, 1996

- For the proposed merger of Severn Trent and South West, the DGWS considered that rapid price reductions across the merged entity towards the top of the 15-20% range would have to be imposed. This equated to a reduction in revenue of £161 million to £215 million a year *(*£2,300 million to £3,070 million NPV, at a discount rate of 7% in perpetuity)[6].

It is possible to take these remedies, proposed to compensate the DGWS for the *loss* of a comparator, and apply them to the gas distribution industry to give an indicative value creation figure for the *gain* of a comparator in the event of a network sale by NGT. Running these calculations[7] indicates that the NPV created by selling an individual gas distribution network is in the order of £550 million to £750 million (see Table 1 below for details).

Table 1: Indicative value creation figures in the event of the sale of a gas DN

	Perpetual loss of revenue (%)	Revenue loss (£m p.a)	NPV of Revenue Loss (£m)
South West + Wessex	15%	69	980
Proposed OFWAT remedy	19%	91	1300
South West + Severn Trent	14%	161	2300
Proposed OFWAT remedy	19%	215	3070
Average Gas DN	**14%**	**34**	**552**
Indicative value creation	**19%**	**47**	**749**

These figures reinforce our view that there is significant value attached to the creation of comparators in the UK gas distribution industry. While the "value loss" figures for South West/ Wessex and South West/ Severn Trent are markedly larger than the "value gain" figures for gas distribution, this is primarily due to the fact that the former figures cover two utiities (i.e. water and sewerage) rather than one. Moreover, it is important to note that the remedies proposed by OFWAT in the cases cited above were developed against the backdrop of a water industry which comprises 10 WaSCs and 13 WoCs in England and Wales. The CC has repeatedly stressed that the smaller the pool of comparators, the greater the value of each individual comparator[8]. This should be borne in mind when considering the implications of the above figures for UK gas distribution.

Background to Comparator Valuation in the UK Water Industry

Since the 1989 Water Act, OFWAT has developed a comparative regime based on the collection and publication of data across all aspects of regulated companies' performance. OFWAT is responsible for making sure that the WaSCs and WoCs in England and Wales provide a good quality, efficient service at a fair price. OFWAT is a government department led by the Director General of Water Services (DGWS).

[6] *Severn Trent and South West Water: A report on the proposed merger*, CC, 1996

[7] In this case, we have taken the perpetual revenue loss % figures from the examples cited above, and applied them to an average DN revenue figure (£246.25m - the mean revenue figure of the individual networks) to generate an indicative revenue gain figure for the sale of a DN. We have then calculated an NPV revenue gain figure, using a discount rate of 6.25%.

[8] See both the 2002 Competition Commission Report quotation on p.2 of this appendix, and p.43 of the 1995 Competition Commission report on Northumbria, where it is stated that "to the extent that each loss of a comparator makes the task of the regulator more difficult, the detrimental impact upon his ability to make comparisons is likely to increase with each loss of comparator".

The DGWS uses comparisons between WaSCs and WoCs to promote efficiency and high standards. He analyses data using econometric and other techniques to establish which companies are most efficient in order to set benchmarks for the others. Thus he aims to set price limits which enable prices to customers to be as low as possible consistent with enabling the WaSCs and WoCs to provide high standards of service while earning an adequate return on capital.

Under the Water Industry Act 1991, the Secretary of State for Trade and Industry is obliged to refer proposed mergers of regulated water enterprises whose assets exceed £30 million to the CC. This provision protects the ability of the DGWS to draw comparisons between companies in order to carry out his duties in an industry where there is little direct competition. This would be prejudiced by the loss of a comparator. Unless the prospective savings from a merger are sufficient to be of "substantially greater significance in relation to the public interest" than the value of the loss of a comparator to the DGWS, the CC will either suggest possible remedies or will recommend that the merger be prohibited.

This creates the problem of how to value the loss of a comparator. Broadly speaking, there are four potential factors to be considered in any quantification of the impact:

1. A company which is at or near to the "efficiency frontier" will potentially be used by the DGWS in setting performance benchmarks for the industry. Since company performance changes over time, however, a company which is not near the efficiency frontier now might be in the future. Consequently this is an important factor for all WaSCs and WoCs, regardless of current performance.
2. The loss of a comparator will change the quality and quantity of information available to the Regulator, which may affect his ability to carry out his duties.
3. By altering the terms of cost-competition between companies, the loss of a comparator may affect the promotion of efficiency and better standards of service in the industry.
4. The loss of a comparator may have an impact on other aspects of the way in which the DGWS uses comparators (e.g. for ad hoc exercises in response to changing circumstances etc).

While these four factors provide a framework for assessing the loss of a comparator, it is still an inherently difficult exercise, particularly when considering the more qualitative functions of the DGWS referred to in 2, 3 and 4 above. Moreover, as the CC stated in a 2002 report, "to the extent that each loss of a comparator makes the task of the regulator more difficult, the detrimental impact upon his ability to make comparisons is likely to increase with each succeeding loss, inasmuch as the loss of a subsequent comparator is a greater proportion of the remaining data available."[9] As the pool of comparators becomes smaller, therefore, the impact of their loss becomes greater. Conversely, the smaller a pool of comparators, the greater the impact of adding additional comparators.

Given these difficulties, it is not surprising that different parties have taken contrasting approaches to valuing the loss of a comparator. Contrasting

[9] *Vivendi Water UK plc and First Aqua (JVCo) Limited: A report on the proposed merger*, CC, p.109.

approaches to valuation, and the different outputs they have generated, are covered in the case studies featured below.

The Valuation of Comparators in the UK Water Industry: Recent Case Studies

The best way to understand the application of comparative regulation and the valuation of comparators in the UK water industry is to look at the treatment of proposed mergers by OFWAT and the CC. For the purposes of this paper, we have reviewed four separate mergers which have been proposed since 1995:

- Lyonnaise des Eaux (NEW)/ Northumbrian Water Group (1995);
- Wessex Water/ South West Water (1996);
- Severn Trent/ South West Water (1996); and
- Vivendi Water UK/ First Aqua (Southern) (2002).

Lyonnaise des Eaux (NEW)/ Northumbrian Water Group (1995)

In March, 1995, Lyonnaise des Eaux (Lyonnaise) announced its intention to acquire Northumbrian Water Group plc in order to merge their respective water businesses in the North-East, North East Water plc (NEW) and Northumbrian Water Limited (Northumbrian). The proposed acquisition was referred to the CC.

The CC asked both parties whether it was possible to quantify the effect of losing a comparator as a result of the proposed acquisition. Lyonnaise stated that "research which it had commissioned led it to conclude that quantifying the loss of a comparator was very difficult, but, it believed, if there were a detriment to be associated with the loss of a comparator, it was extremely small"[10].

Northumbrian Water Group commissioned a study from the economic consultants National Economic Research Associates (NERA) which attempted to quantify the impact of the loss of a comparator. The study was based on a comparison of regulatory experience in the electricity and water industries. It concluded that the lower bound of the present value of the detriment from losing a single comparator could range from £100 million to £350 million, depending on the specific assumptions selected.

The DGWS gave evidence to the effect that the loss of Northumbrian as a separate comparator would seriously prejudice his ability to make comparisons and would therefore weaken the effectiveness of the regulatory system. He argued that it was neither possible nor appropriate to attempt to quantify the impact of the loss of a comparator. However, he did state that, in his judgement, the merger of Northumbrian Water Group and NEW and the consequent loss of Northumbrian as an independent water comparator were towards the upper end of the scale of loss that would result from mergers between water companies. He therefore urged the CC to resist the proposed acquisition unless it produced a new and better comparator, at or close to "the efficiency frontier" in the UK water industry, which would remedy the loss of Northumbrian as a comparator.

[10] *Lyonnaise des Eaux and Northumbrian Water Group plc: A report on the merger situation*, CC, p.43

The CC agreed with the DGWS's arguments, concluding that prospective savings from the acquisition were insufficient to outweigh the impact of a loss of a comparator to the DGWS. The Commission ruled that the acquisition "may be expected to operate against the public interest, with the particular adverse effect of prejudice to the DGWS's ability to make comparisons between companies". It continued that the loss of a comparator could only be remedied if "a single new Appointment is made for the merged enterprise which requires it to maintain or exceed current levels of customer service . . . this new Appointment should have the effect of securing substantial price reductions sufficient to compel the merged company to the forefront of efficiency in the industry"[11].

The CC referred back to the DGWS for details of the proposed remedy. Following meetings between the DGWS and Lyonnaise, the following guidelines were agreed:

- Lyonnaise gave assurances that, in the event of the merger taking place, prices would be reduced by 15% to all customers of the combined water businesses over the next six years (equivalent to a reduction in revenues of £20 million annually at 1993/94 prices)[12]. Sewerage charges would not be affected.
- Ofwat secured informal assurances that Lyonnaise would list its entire UK water interests on the London Stock Exchange by the end of 2005. In the meantime, Lyonnaise agreed to publish information about those water interests which would normally be published by a company quoted on the Stock Exchange.
- In addition, Lyonnaise told Ofwat that it would not mount any takeovers or acquire sufficient interest to enable it to influence the policy of any other water or sewerage company in England and Wales within a ten year period of the start of the new joint operation unless it had the Director General's consent. In the case of Hartlepool Water plc this assurance will continue indefinitely.[13]

The acquisition was completed on this basis in 1995.

Wessex Water/ South West Water (1996) and Severn Trent/ South West Water (1996)

In March, 1996, Wessex Water plc (WW) announced its intention to acquire South West Water plc (SWW). In the same month, Severn Trent plc (ST) announced its intention to make a bid for SWW. All three parties owned regulated water and sewerage businesses, respectively Wessex Water Services Ltd (WWS), South West Water Services Ltd (SWWS), and Severn Trent Water Ltd (STW). Both proposed acquisitions were referred to the CC.

The CC was provided with two estimates which sought to place a value on the loss of a comparator, one from OFWAT and one from London Economics (LE), commissioned by SWW. The Commission noted that the two studies "approached the question in quite different ways and were in effect valuing different aspects of the effects on the comparative system"[14]. It also suggested that both studies had overlooked some important factors and that neither estimate made any allowance for the potential development in the use

[11] *Lyonnaise des Eaux and Northumbrian Water Group plc: A report on the merger situation*, CC, p.8

[12] *Lyonnaise des Eaux and Northumbrian Water Group plc: A report on the merger situation*, CC, p.14

[13] OFWAT press release, 7 November 1995

[14] *Wessex Water plc and South West Water plc: A report on the proposed merger*, CC, p.58

of comparators. The contrasting approaches were described by the CC as follows:

> OFWAT's analysis was based on the possible ranges of higher costs which the DGWS might be obliged to allow for in setting price limits because of the loss of a leading comparator. The method adopted by OFWAT simulated the effect, at the next Periodic Review, of a company becoming the leading comparator for operating expenditure (i.e. the frontier company) and this being reflected in the price determination. OFWAT then reran the cost and price simulations assuming the loss of this leading company and this resulted in a level of efficiency which was lower than it would otherwise have been and which in turn resulted in prices in all other companies being higher than they would otherwise have been. OFWAT derived a range of potential losses by carrying out a large number of such simulations . . .
>
> LE's estimates covered both operating costs and capital expenditure using different methodologies for the two . . . LE also provided estimates of the value of losing SWWS as a financial comparator. So far as operating costs are concerned, LE's estimates of the effect of losing a comparator used OFWAT's modelling work as the basis for calculating the greater statistical uncertainty, quantified in the form of wider confidence intervals, which would result from the loss of an independent company. In LE's approach this greater uncertainty would lead to the DGWS reaching less precise conclusions on efficiency targets, which in turn would lead to less stringent price caps and to prices being higher than they would otherwise have been. Its estimates for capital costs were based on the loss of a company (defined as one whose performance placed it in the lower quartile in cost terms). The expected increases in costs for water and sewerage projects were then worked through in terms of higher price controls.[15]

The results of the two different analyses are illustrated in Table 2 below:

Table 2: Value of a lost comparator – OFWAT and LE estimates, 1996[16]

	£ million (1994/95 prices, NPV)	
	Average	**Range**
OFWAT's estimates*	**500**	**200-770**
LE's estimates^		
Operating efficiency: water and sewerage	460	300-600
Capital expenditure: water and sewerage	95	45-145
Total	**555**	**345-745**

**OFWAT's estimates relate to the loss of a comparator of the size of SWWS, assuming that it was a frontier company. Its estimates are based on operating costs of water services only using a 7% discount rate in perpetuity.*

^LE's estimates relate to the loss of SWWS as a comparator using an 8% discount rate and a ten-year time period

The DGWS commented on both estimates to the CC. He considered that "OFWAT's work explored only one aspect of the many important ways in which comparators were used" and consequently believed that "OFWAT's results significantly underestimated the potential damage to comparative competition". The DGWS continued that "by including capital expenditure and sewerage services in the calculation, the value of the loss would be substantially larger, possibly by up to four times as much". In relation to the LE estimates, the DGWS commented that "in his view LE's estimates of loss

[15] *Wessex Water plc and South West Water plc: A report on the proposed merger*, CC, p.58

[16] *Wessex Water plc and South West Water plc: A report on the proposed merger*, CC, p.59. It is worth noting that , according to the LE estimates, c.17% of the value of a lost comparator is derived from capital expenditure, with the remainder coming from operating efficiency.

were to be seen as additional to those identified in OFWAT's simulation analysis"[17].

The final CC ruling was very similar for the two proposed acquisitions. It concluded that "the loss of SWWS as a comparator would seriously prejudice the DGWS's ability to make comparisons between different water enterprises", though it added that it did not think that this loss could be reliably quantified. The Commission did not believe that the prospective savings and other benefits to be expected from either merger out-weighed the detriment to the DGWS's regulation of the industry, and, in the case of the Wessex proposal, it also noted that "the disappearance of the border between WWS and SWWS . . . would reduce the scope for future cross-border competition between water enterprises".

In both cases, the CC discussed with the DGWS whether it would be possible to devise a remedy for these problems. The DGWS stated that any remedy for either proposed acquisition would have to include a package of measures designed to create an exemplary comparator. For the Severn Trent proposal, the DGWS considered that rapid price reductions across the merged entity towards the top of the 15-20% range would have to be imposed. This equated to a reduction in revenue of £161 million to £215 million a year *(*£2,300 million to £3,070 million NPV, at a discount rate of 7% in perpetuity) compared with total revenue for SWWS of £237 million a year. For the Wessex Water proposal, the DGWS suggested price reductions across the merged entity towards the bottom of the 15-20% range. This equated to reduction in revenue of £69 million to £91million a year (£980 million to £1,300 million NPV, at a discount rate of 7% in perpetuity).

In both cases, the CC concluded that no recommendation it could make would be sufficient to remedy the loss of SWWS as a comparator. Consequently it recommended that both proposed mergers should be prohibited.[18] Following the adverse reports of the CC, the Secretary of State blocked the proposed bids.

Vivendi Water UK/ First Aqua (2002)

In 2002, Vivendi Water UK plc (VWUK) announced its intention to acquire Southern Water Services Ltd (Southern), a regulated provider of water and sewerage services in south-east England, from First Aqua Holdings Ltd (First Aqua). VWUK owned three regulated water companies in England and Wales and had a 31.4% holding in a fourth, South Staffordshire Group plc. The proposed acquisition was referred to the CC.

The DGWS submitted that losing Southern as a comparator would weaken the regulatory system. He also contended that an additional loss would be incurred from the disappearance of Folkestone and Dover Water Services Limited, one of VWUK's existing WOCs, which he believed would be absorbed into Southern as a result of the merger.

[17] *Wessex Water plc and South West Water plc: A report on the proposed merger*, CC, p.58

[18] *Wessex Water plc and South West Water plc: A report on the proposed merger*, CC, p.9

The DGWS produced a model which attempted to quantify the value of the loss of Southern as a comparator. The approach of this model was outlined in the CC Report as follows:

> The DGWS acknowledged that the loss of a comparator impacts at two levels:
>
> 1. it affects the judgement of the efficiency frontier; and
> 2. it reduces the number of data sets used in the statistical analysis.
>
> In calculating the value of the loss of a comparator, the DGWS considered both of these factors, but concentrated on the hypothetical analysis of the effect on judgements of the efficiency frontier to provide an estimate of the value that losing an independent comparator would have on his ability to regulate the industry. The DGWS made individual calculations that were representative of all companies in the industry and then used these calculations to examine what the actual impact might have been if Southern were lost as an independent comparator and it was the frontier company. . . .
>
> Using a series of standard rules, the potential overall scope of savings that might have been incorporated in price determinations if the target company was both the frontier company and available for use as the benchmark company was calculated. The loss of the target company was then simulated by moving it down the league table and generating a revised profile of potential savings that could be made given the same standard rules. A measure of the loss of the target company was illustrated by the difference between these two profiles. By carrying out a large number of profiles, the DGWS was able to derive a range of potential losses which would apply to companies in the water industry.[19]

The results generated by OFWAT's model are illustrated in Table 3. They show that, in the case of the proposed acquisition of Southern Water, an average loss of £450m would be incurred, with a range of £330m-£1330m. According to the DGWS, limitations in the model meant that these results "must significantly underestimate the damage to competition through the loss of a comparator". The results should be interpreted in this context.

Table 3: Impact of the loss of a leading water service comparator at the next periodic review[20]

Target Company	Turnover Range £m	Typical Company	Average Loss £m (NPV)	Range £m (NPV)
Very large local or medium regional company	76-150	Wessex, South East, South West, Southern	450	330-1330
Large regional company	151-300	Three Valleys, Dwr Cymru, Northumbrian, Anglian	540	420-1380
Huge regional company	301->401	North West, Severn Trent, Thames, Yorkshire	620	510-1440

Note: These numbers illustrate the possible impact of the loss of a leading comparator only in so far as it affects the price limits set at the next periodic review. Other aspects of the loss of a comparator are not included in these numbers.

The CC took account of the DGWS's submission in reaching its final conclusion. It ruled that VWUK should be required to divest its stake in South Staffs Group, thereby securing the independence of that company as a

[19] *Vivendi Water UK plc and First Aqua (JVCo) Limited: A report on the proposed merger*, CC, p.205

[20] OFWAT figures, quoted in *Vivendi Water UK plc and First Aqua (JVCo) Ltdd: A report on the proposed merger*, p.209

comparator and mitigating the impact of the loss of Southern as a comparator.

Following on from the Commission's enquiry, Vivendi decided that it no longer wished to acquire the whole of Southern. It therefore brought forward new proposals to acquire only a minority stake in Southern with RBS taking the controlling stake. OFWAT recommended a package of measures designed to address the harm to the regulatory regime arising from Vivendi's ability to influence Southern through its minority stake. These involved the sale of Vivendi's minority stake in South Staffordshire Water, undertakings to limit Vivendi's influence and the provision of a new data set. The acquisition was completed in 2003 on this basis.