Section 3
Competition

Section 3: Chapter 11
Competition: Development of Competition

The broad issue and potential impact of competition was discussed in general terms in the introduction to this Review. In this chapter, I describe in more detail how competition is likely to impact on the existing service providers. I conclude that competition will bring major benefits to all customers and does not need to be the major threat to the revenues of the Scottish water industry that has been predicted. This will depend upon the achievement of efficiency targets by the management of the Scottish water industry. Their focus needs to be on cost reduction and movement rapidly towards the 'efficiency frontier' and, no less importantly on developing tariffs that reflect the true economic costs of supply. The only significant revenue impact if management achieve efficiencies will be in the water and sewerage 'retail' activity, but proper allocation of costs can keep this to a minimum. Competition will benefit customers precisely because it will force costs to the lowest sustainable level (as it has in other utilities' services, see Chapter 12) and this will ensure that we, as customers, will get the lowest sustainable prices. It is therefore in the customer's interest.

a) Introduction

Generally, customers have benefited from competition in three ways, each of which has typically impacted on the other two:

- **Choice:** Customers are able to exert a lot more influence on their current supplier if they are able to opt for an alternative supplier. This choice tends to focus the incumbent supplier on addressing the issues raised by the customer.
- **Lower prices:** There is considerable evidence that competition has led to lower prices for customers. This has come about through very significant improvements in capital and operating efficiency. Suppliers have sought pro-actively to identify efficiencies in order to position themselves better in the service they offer to customers.
- **Better levels of service:** For some of the highest value customers, a few pounds off an annual bill are significantly less important than improved service. This may, for example, result from convenience in payment method. Some customers value the receipt of a single bill for utility services and a single direct debit each month. Utility suppliers have as a consequence tried to outdo their competitors with the level of service they offer.

It is common to regard the Competition Act 1998 as the starting pistol on introducing competition into the water sector. Whilst this Act may have been the catalyst that brought customer benefits, such as choice and efficiency, to the water sector, it would be incorrect to state that competition did not exist prior to the Act. Competition to provide solutions to the water and effluent needs of major customers already existed – via the so-called "off-network" deals. Brokerage (retail) deals have also existed on a small scale.

The Act potentially makes competition at the start and at the end of the value chain possible without replicating the pipeline network, which is a clear natural monopoly. Common Carriage where the pipeline operator is obliged to carry the water or waste of a third party would be the mechanism to facilitate this competition.

Incumbent monopolists ought to embrace competition. Those companies who have looked at competition as an opportunity have typically thrived, whilst those who have tried to resist and follow a reactive strategy have often found life more difficult. Three elements are important in the strategy of an incumbent that seeks to benefit from competition.

- The first key issue is to understand how competition for revenue can arise and what threat it may pose to the on-going financing of obligations.
- The second is to quantify the effect of competition for revenue in order to understand which customers are most likely to be vulnerable if an alternative service is offered. This is the subject of Chapter 13.
- The third factor is to develop a thorough understanding of the costs incurred in providing a service to customers. It is vital that these costs cannot only be split by customer, but also by business process.

Understanding costs and the need for transparency from a customer perspective is the subject of Chapter 14. The benefits of the incumbent seeking to exploit the opportunities presented by competition do not accrue solely to customers. Employees and shareholders have also benefited.

b) Viability of competition

In many markets competition will develop naturally. In other markets, the development of sustainable competition may need intervention by government or by regulation. The

electricity and gas industries are good examples of how government policy has forced competition into a sector and brought about significant benefits to customers. This was done by ensuring that the natural monopoly element in the provision of utility services was ring-fenced and the other activities were allowed to become competitive.

The following matrix can be quite useful[1]:

Table 11.1: Competition matrix

	Desirability of competition		
Feasibility of competition		Yes	No
	Yes	Normal market	Cream skimming through market power
	No	Dominant player limits entry	Natural monopoly

Most analysts used to consider that competition in the utility services was not feasible. This was because utilities were regarded as natural monopolies. However, recent history has shown that competition did not develop because there were some elements of natural monopoly and other elements of the value chain which, although they were clearly not natural monopolies, the monopolist was too dominant and it had not been possible to enter the market. A good example is meter reading. For example, there is clearly no obvious benefit in each utility service reading their own meters, and hence there is no natural monopoly. However, it took regulation to disentangle meter reading from the natural monopoly and to facilitate competition in this area.

The perceived infeasibility of competition was therefore partly due to natural monopoly and partly the result of a dominant player who could limit entry. Claire Spottiswoode, former Director General of Ofgas, viewed ring-fencing the natural monopoly element[2] in the gas industry as the key to the competitive supply market in that industry.

In order to understand the likelihood of competition in the water industry, it is important first to identify the scope of the natural monopoly. Then, any other activities, where it may be simply the dominance of a major player that is preventing the development of competition.

c) 'In the market' versus 'for the market'

The distinction between 'for the market' and 'in the market' competition is useful in assessing the development and progress of a competitive market. Competition for the market will tend to drive further efficiency into any industry and, in the public sector context, will undoubtedly bring benefits to customers. However, genuine competition in the market – where feasible – will go further in improving service levels and reducing costs for customers.

The water industry is not fundamentally different from other utility businesses in that it is vertically integrated and as such the water services provider is involved in more than one activity or line of business. Each of these activities, whilst discrete, complement and build off each other in such a way that the service required by customers is delivered. Moreover, each of these activities has quite distinct characteristics and requires different competences, if it is to be done efficiently and effectively.

If one is to argue that competition will not bring benefits to customers, it must be possible to say that the 'agency' costs of separating activities or of contracting out will more than outweigh the benefits that would accrue from the provision of an activity by a specialist. In most industries, empirical observation proves that these agency costs do not outweigh the benefits. Few, if any, industries today, whether capital intensive (electricity, oil and gas) or not, for example, fast moving consumer goods are wholly vertically integrated.

Is the water sector really that different? The fact that many companies find opportunities in a sector with limited growth potential, and where total returns are limited (so that opportunities rely on a lower cost solution being found) would suggest strongly that it is not.

i) 'For the market' competition

This type of competition can exist even where the vertically integrated regional monopoly holds sway. Essentially, it can manifest itself in two ways: a proposal to the incumbent monopolist to provide a service at lower cost or higher quality than the incumbent can achieve; or an offering to a customer to replace the existing vertically integrated supplier with another. The latter is essentially the inset appointment, which is the only real competition that exists at present in England and Wales as

[1] Kay & Vickers, 1988 *Regulatory Reform in Britain* Economic Policy, 19.

[2] The Institute of Economic Affairs 2nd Annual Conference, 20 June 2001: Water 2001.

far as customers are concerned. This is very limited, accounting for only 0.2% of total industry revenues. 'For the market' competition assumes that there are a series of one-off opportunities. It assumes that the geographical (or other) monopoly will not substantially erode and that essentially ownership of assets will remain in the same hands. The only real way to be more competitive is to move the boundaries of business processes slightly, or to generate value opportunistically through innovation and efficiency within the existing integrated chain of business processes.

The benefits to customers from this type of competition can be quite significant as costs will be driven down and service levels will be improved. Customers are unlikely, however, to be presented with any real choice. It is therefore better than the traditional monopoly service provider, but not as good for customers as full blown in the market competition.

ii) 'In the market' competition

In the market competition will result when there are genuine markets for the separate business activities that are conducted by water and sewerage suppliers. This presupposes the fragmentation of the value chain at least in part along functional lines. The most obvious such split may be between the wholesale and retail functions, although in the market competition could develop in other areas of the value chain.

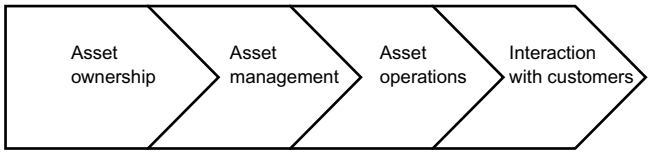
d) Competition for the market

Competition for the market is likely to develop in industries where there are large elements of natural monopoly, or where there are significant agency costs that provide an advantage to an incumbent over a new entrant. It is most likely in situations where competition in the market is not regarded as feasible. This would not apply, for example, in the footwear business where competition in the market is intense. This is the normal market shown in the matrix earlier in this chapter. In the footwear market, there is significant competition between manufacturers, between wholesalers and between retailers. Competition at each stage of the process helps keep prices down for customers. The situation is dynamic and a manufacturer or wholesaler can do well one season and badly the next. Indeed competition can, in times of over-capacity, occur between retailer and wholesaler.

For the market competition may help bring value to customers through lower prices where there are few opportunities for the development of in the market competition through the functional value chain. Most of the activities of a water and sewerage undertaker seem to contain significant elements of natural monopoly and therefore competition may be more likely to develop for the market than in the market. The notable exception to this appears to be retail (and potentially the consequent demand for common carriage).

Competition for the market can take place at any point along a business process value chain. The basic business processes of a water and sewerage undertaker are shown in Figure 11.1.

Figure 11.1: Organisational structure of water business



For the market competition can take place across the entire value chain, when the asset owner is bought out. The incumbent can also be replaced for any single process (in part or as a whole). The owner and manager of the assets require that they be operated. It is possible that competition will develop to operate the existing assets either as a whole or within a particular region. This does not impact upon the service received by the end customer (if the contract has been properly concluded), nor does it influence ownership of the assets. However, it is competition nevertheless. Competition for the market will reduce costs and should improve levels of service.

The only criterion that needs to hold true if benefits are to accrue to customers is that interest in tendering for a contract is such that there is genuine competition between tenderers. Potential new entrants will come forward to offer their services and therefore develop for the market competition, but only if there is an opportunity for the third party to provide a service either significantly better or at lower cost. This may result from innovation or from greater efficiency.

The next section describes the various elements of the value chain depicted above. These descriptions, and the assessment of the key requirements for success in each activity, are

essential to an understanding of the likelihood of for the market competition developing.

i) Explanation of activities

Asset ownership

The water authority owns the assets that it uses to carry out its business. The actual value of these assets is significantly in excess of the accounting balance sheet value. Indeed, many assets would be impossible to value in any realistic way because they are genuinely irreplaceable. The assets include reservoirs, water and waste treatment works, the water distribution and sewage collection network, and also depots, vehicles and other equipment.

Under the public sector model of the Scottish water industry, the Scottish Executive strategically directs the water authority's ownership of the assets on behalf of all of us. Ownership in this context requires the Scottish Executive to identify the needs of stakeholders and set appropriate levels of risk. It determines, for example, how often customers can tolerate hosepipe bans or sewer blockages.

Asset management

The water authority has a duty to provide water and waste water services. This requires decisions on a day-to-day basis to be made about assets. These questions are basic, but fundamental, and will determine the efficiency over the medium to longer term with which the service will be delivered. The questions concern if assets should be bought, what should be bought, when and how they should be operated.

Asset management strives to minimise risk in line with the priorities set by the owner. The water authority needs to ensure that there is both a financial and an engineering plan, which will present a clear vision of the asset mix required at a specific time in the future. This vision should be supported by an investment plan, which comprises the projects to be implemented, prioritised by compliance deadline, cost and benefit.

Asset management is both strategic and dynamic and continuing reassessment is vital.

Asset operation

Asset operation is about the delivery of a service on a day-to-day basis. Asset operation ensures that water is properly treated and delivered to customers and that sewage is collected and properly treated.

The asset manager, who is responsible for the whole portfolio of assets, sets operational policies. The asset operators make no decisions, beyond those delegated to them by the asset manager. The aim is to ensure that responsibility and authority remain in alignment.

Retail

The retail of treated water involves the direct, customer-facing activity in the supply of the service. This would include the billing process and collection of charges, the call centre, and responses to customer enquiries, complaints or requests for information. It would also include liaison with the network or treatment plant operator in order to be able to deal effectively with customer issues.

At the present time, the local authorities currently issue bills to domestic customers for water and waste water charges and collect the charges on their behalf. The water authorities deal with all other interactions with domestic customers. The water authorities deal with all retail activities in the case of non-domestic customers. This includes billing, but it also includes key account managers who are responsible for understanding the key needs of the largest customers and ensuring that the service delivered is appropriate.

ii) Key requirements for success in each functional activity

Each of these four areas requires very different skills and resources. There are also quite different risk profiles pertaining to each activity. In some cases it may be appropriate to consider inviting a third party to tender to provide the service or a part thereof. In others, it would clearly be inappropriate, as the activity is seen as a key skill or as a constraint. A third party will, however, only be prepared to provide a service where he can see that a reasonable return is available given the investment required. Ownership of assets by the public sector is taken as a constraint and is therefore not discussed further.

Asset management

Asset management is a strategic, analytical discipline, which seeks to calculate accurately risks and fully assess the financial and other costs of addressing these. Regulators have consistently maintained a view that this is a core skill, which should not be outsourced if the licence holder (the owner of the assets) is to be held responsible for service delivery to customers. I agree with this general sentiment but recognise that, as this is such a key skill, creative solutions may need to be found to attract these capabilities to the Scottish water industry. Any solution will have to ensure that there is sustainable, long-term development of competency in this area by the proposed Scottish Water or by the current three authorities.

Asset operations

Reliability, a partnership approach and cost effectiveness are the key factors for success in this area.

Interaction with customers

The retail function is quite different from others that are described above. There is much greater heterogeneity in the customer base than there would be for any of the other business processes discussed above. This may mean that the level of service may be more important than simple delivery of a basic service at minimum cost. Issues such as convenience and responsiveness may be at least as important as a few pence off a bill. Other services (such as gas, electricity or telephone) on a single bill may be more important for some people.

The management of a customer base is not an easy task. It involves far more than the generation of a bill for a service that has been provided. It concerns the exploitation of opportunities that each customer presents. This is the essence of customer relationship management. Effective management of the customer database requires a significant investment in information technology. This means that economies of scale and scope become very important. The investments relative to capital spending elsewhere in the value chain may not seem large, but the benefits may be more difficult to realise.

iii) Likelihood of competition for the market developing

It is likely that significant competition may develop for the asset operations services. It has been estimated by City analysts that this could amount to as much as £2.85 billion per year, or more realistically £1 billion over the next 4 to 5 years (35% of total spending on operating assets)[3]. There are a number of organisations, including all of the English companies and many specialist contracting companies, who are likely to be interested in tendering for this sort of opportunity.

It seems likely, given the creation of the Glas Cymru[4] not-for-profit company, detailed in Chapter 12, that the competitive dynamic of this sector of the industry is set to increase. This reflects the relatively low barriers to entry. The contracting of operations to United Utilities by Welsh Water has, not surprisingly, been heralded as a model of competition for the water industry. Particularly striking was the degree of interest that was expressed in the outsourcing contracts offered by Welsh Water. Severn Trent was sufficiently interested in the potential opportunity that it challenged the original proposal by WPD to involve United Utilities in the operation of the water assets. In the end, in excess of six offers were received and the price tendered was significantly lower than the original agreement between WPD and United Utilities. It seems likely that there is a more developed market for out-sourcing of contracts than was previously thought. It is possible that in Scotland equally competitive bids for any out-sourcing opportunities could be encouraged.

The competitive dynamic of this activity depends to a great extent on the competition in the market of tendering for contracts. A competitive tendering process should provide competitive forces that lead to greater efficiency and result in service and price benefits to the consumer. Shorter contracts would also probably increase competition for the provision of these services. This is because the contractor will be keen to

[3] In a report entitled *O&M Markets* dated 5 September 2000, Robert Miller-Bakewell of Merrill Lynch forecast that 35% of the operation and maintenance market could be outsourced by 2005.

[4] Western Power and Distribution acquired Hyder Plc which owned both SWALEC and Welsh Water. WPD had no interest in retaining the water business and proposed to sell it on to Glas Cymru, the not-for-profit holding company. Welsh Water (Dŵr Cymru) is a subsidiary company of Glas Cymru. The operations of the business were to be run by United Utilities under contract to Welsh Water (Dŵr Cymru).

perform to a level, which ensures that they are in a strong position when the contract is being renewed. It would also be important to ensure that the terms of the contract do not limit future competition, and that there is an onus on the winner of any operating contract to pass their activities over to another party at the end of the contract period.

It is also important to note that the water industry is global, and so too is the competition, as not only UK companies can compete for contracts.

The example of Welsh Water is also interesting in the customer arena. Welsh Water had looked to tender the provision of retail services to its customers by a third party. It has encouraged for the market competition. Thames Water won this contract and is therefore responsible for providing all of the customer facing and related back office services. The bill will still be issued under the name of Welsh Water and there is likely to be a small note on the bill that states that services are provided on behalf of Welsh Water by Thames Water.

If the Scottish local authorities had won the billing contract in a competitive situation, then this would not be any different, economically, to Thames Water being paid to bill Welsh Water's customers on its behalf. For the Scottish industry it may be appropriate to assess whether contracts with the local authorities remain the best way to deliver the billing and collection service. It is possible that some other organisations may be able to bill and collect more efficiently.

e) Financial implications of for the market competition

For the market competition would not impact on revenues of the incumbent authority in Scotland. Off-network deals are sometimes regarded as a form of for the market competition and these could impact on the revenue line.

For the market competition will, however, reduce the costs faced by the incumbent supplier. This is likely to bring benefits by providing more options to management in how service could be delivered at best value to customers.

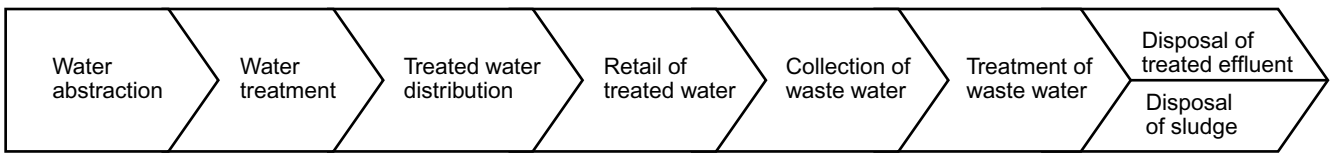
f) Competition in the market

Customers will benefit from the development of competition in the market. So too will the owners of assets. Consequently, in Scotland, customers would benefit as customers and as part owners of the assets. They will benefit from better levels of service, better efficiency and more choice. A ready market will also ensure that these benefits can be sustained over the long term. This adds value to the owner and benefits the customer by removing many of the risks associated with service delivery.

A useful way to consider opportunities for competition 'in the market' in the various activities that are integral to the supply of water and waste water services to customers is to break them down into a value chain. I will begin by providing a very brief overview of each functional activity, and continue by analysing what I see as the key criteria for success in that activity.

My analysis uses the framework developed by Professor Michael Porter of Harvard Business School - the five forces model - in order to predict the likelihood of competition developing at each stage of the value chain[5]. This framework takes full account of difficult-to-acquire competences and significant economies of scale. Ultimately, competition will only develop where the returns that are available to the new entrant are commensurate with the risk to capital that would have to be invested.

Figure 11.2: Water authority value chain



[5] This framework is outlined in full in *Competitive Strategy* (The Free Press 1980). A summary of the framework is outlined in chapter 6.

Porter's five forces have been used to analyse the potential for competition within each of the functional activities. The five forces are:

- ease of entry
- buyer power
- supplier power
- availability of substitutes
- the competitive dynamic of the industry.

i) Explanation of activities

Water abstraction

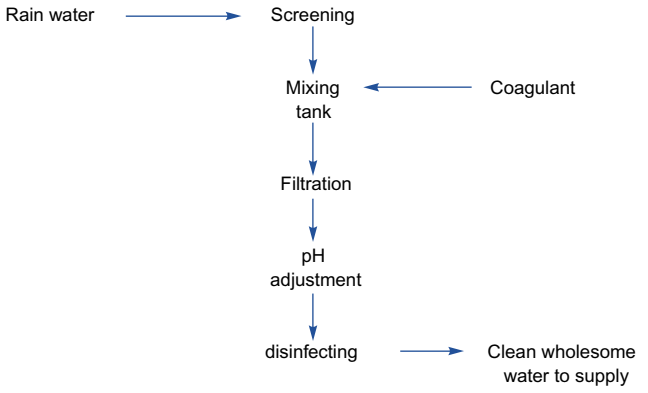
The water used by authorities is taken from surface water, lochs, streams and rivers, or from groundwater which is rainwater that has soaked through the soil and is stored underground. River water quality is generally much more variable than reservoir or loch water, as flows vary during the year and rivers are more susceptible to pollution. Groundwater is stored in naturally formed underground reservoirs called aquifers. Groundwater is normally very pure because it is filtered as it passes through rock to the aquifer. The water is brought to the surface by drilling a bore hole into the rock and inserting a pump at the bottom.

Water treatment

Water treatment involves physical and chemical processes that capture impurities so that the water is safe to drink. The chemical process is set out in Figure 11.3.

Treatment is a necessary part of the water supply service to ensure adequate and continuous supply of wholesome water under the terms of the Water (Scotland) Act 1980. The level of treatment required depends upon the quality of the incoming water. Clearly, therefore, more treatment is likely to be required for river water than for ground water. Raw water is made safe by a complicated process by which the raw water is filtered either under very great pressure or through a chemical process. After this process is complete, the acidity or alkalinity of the water is checked and if necessary is subjected to pH Adjustment. The water is then disinfected, usually with chlorine, to remove the bacteria capable of producing disease.

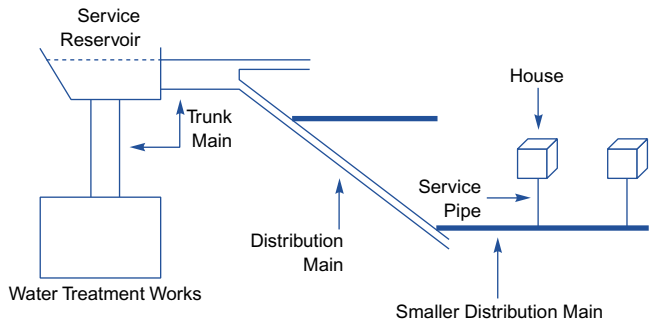
Figure 11.3: Chemical water treatment



Treated water distribution

Treated water is transported to customers in a distribution system. This distribution system is local (or, at best regional). This limits the supply / demand balance to the local level rather than the national level, which is what happens in the electricity and gas sectors. The distribution system is a network of pipes and pumps (the water mains) that deliver the water to those places where it is needed. Storage tanks are often used at treatment works or further downstream in the distribution system to balance the supply of water into the system and demand for the water from customers. The water in the distribution system will typically pass through mains of decreasing size as it nears the customer. At the boundary of the customer's property, the water will pass into service pipes, which are the responsibility of the individual customer. The distribution system is shown in Figure 11.4.

Figure 11.4: Distribution system



One of the problems facing the water industry is the loss of water in the distribution system through leaking pipes. Much of the water mains network is made from old, cast iron pipes which, compared with modern steel and plastic pipes, are much more prone to leaks and bursts. It is the responsibility of the water authority to track down and mend leaks, and to refurbish or replace worn out pipes.

Retail of treated water

This activity has been described in detail above. It involves all of the customer-facing activities such as billing, collection, customer service and the provision of information.

Collection of sewage

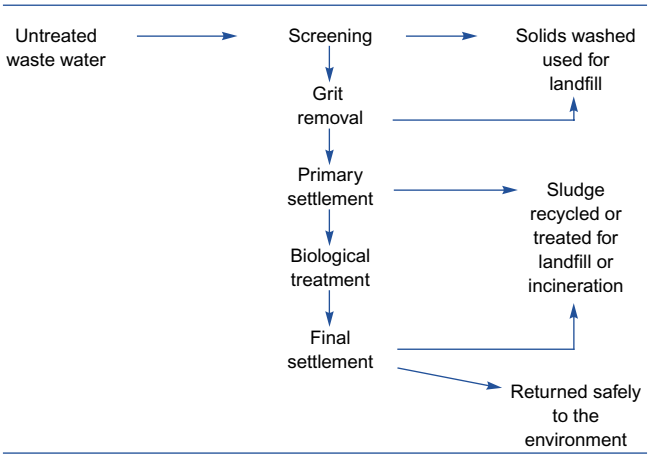
Sewage is the waste water from homes, offices, factories and other buildings together with rainwater from roads, footpaths and roofs. It is collected and taken for treatment through a network of drains and pipes, known as sewers. Most properties are connected to the public sewer, which belongs to and is the responsibility of the water authority. In a few cases, properties drain to a private septic tank or to a local water course. In these cases, the drainage of properties is the collective responsibility of the owners of those properties.

Sewers work by using gravity and pumps to carry the sewage to a waste water treatment works.

Waste water treatment

Waste water treatment works harness natural processes to remove the non-water from waste water and to clean the water so that it can be safely returned to a river, estuary or the sea. The waste water treatment process is set out in Figure 11.5.

Figure 11.5: Waste water treatment



Preliminary treatment involves passing the untreated waste water through a sieve-like device to remove large objects. Primary settlement involves removing fine solids. The waste water passes through primary settlement tanks, in which finer solids settle to the bottom of the tank forming a sludge that is collected for further treatment. Biological treatment is used to remove dissolved substances. The waste water from the primary settlement tanks is treated biologically as it passes through the filter bed. Final settlement removes any remaining fine solids. After final settlement the effluent is in most cases clean enough to be discharged.

Disposal of treated effluent

Treated effluent is the waste water after it has been treated; this is disposed of by discharge to a river, stream or the sea. The effluent discharge from treatment works will still contain some bacteria, but this is the case with all water found in the natural environment. The bacteria in the effluent from waste water treatment works are enormously diluted at the point of discharge. The discharge of treated effluent is regulated by law and is monitored and controlled by the Scottish Environment Protection Agency.

Disposal of sludge

Sludge is produced as a result of the two settlement stages in the treatment of waste water. Sludge can be sent to landfill or it can be used as a fertilizer for agriculture or forestry. Proposals to allow treated sludge to be used in the generation of electricity are also being examined.

ii) Key requirements for success in each functional activity

The functional activities break down into four broad areas:

- interaction with the environment (abstraction of water, discharge of treated effluent);
- production and treatment (treatment of raw water, treatment of sewage);
- networks (distribution of treated water and collection of sewage);
- retail (interaction with end customers).

Each of these four areas requires different skills and resources. There are also quite different risk profiles pertaining to each of them. Competition will develop where a new entrant can see that a reasonable return is available given the investment required.

Interaction with the environment

In Scotland there are only limited controls on abstraction of water. In England and Wales, abstractions are subject to licences. It is likely that with the introduction of the Water Framework Directive, abstraction of raw water in Scotland will become subject to a similar licensing regime (probably within two to three years) as currently exists in England and Wales. Abstraction rights are likely to have a high value where water is in short supply and less value in locations where raw water is plentiful.

According to Ian Byatt, former Director General of Ofwat, "Water is a natural monopoly combining considerable sunk costs in the infrastructure with high transportation costs. It is a rising cost industry, where cheap sources of supply are generally above average costs. There are geographical constraints on supply"[6].

Table 11.2 produced by Ofwat compares the indicative add-on costs for water, gas and electricity for the UK.

Table 11.2: Indicative add-on transport costs[7]

	Electricity pence/kWh (400KV)	Gas pence/therm (24" pipe)	Water pence/m^3 (36" pipe)
Bulk cost (excluding transport)	3.0	20	30
Transport cost per 100km	0.15	0.5	15
Transport add-on per 100km	5%	2.5%	50%

Two other factors are likely to influence the value of a right to abstract. The first is the quality of source. It is obvious that if a source offers a better quality of raw water, which in turn requires less costly treatment, then this source will have a greater value than another source located in the same area. The second factor, and probably by far the more important, is the availability of a transportation and, possibly a treatment, infrastructure. Water is heavy and is difficult to move between source and treatment works. If there is a transportation infrastructure (with available capacity) located nearby, this source is likely to have a greater value. Similarly, if the water had to be treated, then it would be vital that the transportation infrastructure should take the water to a treatment works that is capable of treating the abstracted raw water. It would also be essential that this extra treated water is actually required by customers and that capacity in the distribution system existed.

The raw water distribution/transport infrastructure would appear to be a natural monopoly. It is probably not feasible to replicate these pipes and valves, and the influence of this natural monopoly and the constraint of the local onward distribution system are likely to hamper severely any attempt to establish in the market competition in the treatment function.

It is possible that the water source could have value to someone other than the owner of a water treatment works or a buyer of potable water. Perhaps, the most obvious example in Scotland is the whisky industry, which strives to guard its water sources. A less obvious example, which will very much influence the revenue of a water supplier, is where an industrial or commercial customer is able to use a raw water source to replace part or all of the potable supply. Clearly, in most cases, development of such a raw water source will be cheaper than the full cost of the potable alternative.

[6] Byatt (1998).

[7] Source Ofwat).

The disposal of treated effluent is controlled by legislation such as the Urban Waste Water Treatment Directive and the Control of Pollution Act. In order to dispose of liquid waste to the environment, it is necessary to obtain a 'discharge consent' from the Scottish Environment Protection Agency. This consent is required by both the operator of a sewage treatment works and by any organisation seeking to discharge untreated liquid waste to the environment. Discharge is often through a sea or estuary outfall - essentially a long pipe which takes the effluent clear of the coastline to a point where the rate of natural dispersal is high. Competitive opportunities may exist for the owners of consents and for the owners of outfalls.

Production and treatment

The production and treatment activity is similar to many other capital-intensive processes. Other examples would include refining crude oil or producing chemicals. The treatment plant must be capable of achieving the standards (as defined either by the customer or by regulation). Once this criterion is satisfied, the only real consideration is to minimise unit costs. Unit costs are minimised by effective procurement of efficient plant (with the minimum whole life cost at the expected throughput) and by managing throughput within cost-effective boundaries. Treating more volume may actually increase costs if greater manual intervention is required or the expected asset life is reduced. The treatment plant can only be built in a location where the distribution system is capable of taking the output and conveying that output to the point of final demand. The plant also has to have access to an appropriate supply of raw water for treatment.

The business drivers of sewage treatment are not materially different from raw water treatment. Sewage treatment is also a capital-intensive activity, where proper management and operation of the asset are critical. Again, minimising unit costs of output is the key to success.

The treatment and disposal of sludge could involve mainly operational expenditure (e.g. disposal to landfill) or quite a high degree of capital expenditure (e.g. the construction of a drying plant). The key drivers of business success are similar to those discussed for water treatment, i.e. compliance with standards is a pre-requisite and unit costs have to be minimised. There is one material difference, which is that the collection of sludge from point of production does not depend upon a pipeline infrastructure, and there is therefore more potential latitude in where the plant is sited. This should improve the likelihood of competitive activity in this area. There is likely, however, to be only a limited number of sellers of sludge.

Networks

The networks of pipes that constitute the water distribution or sewage collection system are a natural monopoly, which it would not be feasible or economically viable to replicate. It is the distribution network, which adds most value to the treated water (see Table 11.2 above).

Infrastructure management is key to making best use of this asset. This involves managing the network to minimise costs to the customer over the long run. To minimise costs the operation of the network must be well understood and any response to issues relating to the performance or condition of the network must be efficient. In some cases this may be pro-active replacement or maintenance, in others a reactive approach may be best.

As a natural monopoly, it is possible for an organisation that is not the owner of the network to seek access to transport treated water to its customers. This is called common carriage, and it is discussed in greater detail later.

It is critical for costs to be minimised because the Competition Authorities or a Court may be likely to consider an access charge that contained a large element of demonstrable inefficiency or misallocated costs to be an abuse of a dominant position and hence a breach of the Competition Act.

Retail

As already explained, retail skills are very different from the other functional areas of the value chain. This is largely because of the much greater heterogeneity in the customer base. Retail is also quite different when the service is being provided in competition with others on a day-to-day basis, as opposed to being a service to customers implemented monopolistically during a contract won by competitive tender. Management of the customer base is not easy and while the investment is relatively low, there is a large degree of risk. As we will see in Chapter 12, Independent

Energy went into liquidation because of its failure to bill its customers successfully.

iii) Likelihood of competition in the market

The Porter model states that there are five basic competitive forces in any industry. The five forces are as follows:

- **Threat of entry** – Porter gives a number of examples of barriers to entry, such as economies of scale, capital requirements and product differentiation.
- **Intensity of rivalry among existing competitors** – depending on factors such as the number or relative market share of competitors (i.e. does one player enjoy de facto dominance because of his scale).
- **Pressure from substitute products.**
- **Bargaining power of buyers.**
- **Bargaining power of suppliers.**

I have used this framework to analyse the likelihood of competition 'in the market'.

The largest return on capital will be received from a sustainable monopoly that has a fragmented customer base and many suppliers, and which provides a service or product to which there are no substitutes. Competition is unlikely where there are significant barriers to entry. Barriers to entry may be the high cost of entry (in capital or in acquiring market share) or a function of the structure, capacity or regulation of the market. Examples of the latter would be the lack of availability of new landing slots at Heathrow Airport (capacity) or the inability of a European Airline to pick up new passengers in, say, New York en route to Los Angeles (regulation).

The availability of substitutes plays an important role in limiting the price that the market will bear. For example, air travel between London and Scotland was more expensive before alternative routes and carriers entered the market. Easy Jet, Go or Ryan-Air are now potential substitutes to the British Airways Shuttle or British Midland service and this has a limiting effect on the prices charged by creating both choice and extra capacity. The more substitutes that are available, the lower the market price. More substitutes will on balance tend to make a market less attractive to a new entrant.

The relative influence of both buyer and seller is also a key factor in determining the attractiveness of a market. There are situations where a seller can be in a very weak position (e.g. the sale of assets in a bankruptcy situation). The converse can also be true, where the product being offered plays an essential role in the activity of the buyer (water can be vital for production of goods, as well as having an irreplaceable role for domestic purposes) and cannot easily be done without. In situations where the buyer has relatively little influence on the seller, then entry into the market is more likely.

The number of suppliers in a market will also influence the attractiveness of that market to a new entrant. For example, sources of crude oil are limited and this will impact significantly on decisions to enter the oil transportation or refining businesses. Both businesses would require a significant capital outlay and the new entrant would have to be certain of access to a supply of crude oil if the investment were to be justified. In contrast, tobacco is sold at auction and there are very many small suppliers. As a result, there is a ready and easily accessible supply market for any organisation that is considering investing in cigarette manufacture.

The final factor influencing the attractiveness of a market is the amount of existing competition and the extent of regulatory or other controls that may limit market liquidity. The lower the influence of regulation and the smaller the number of competitors, the more attractive the market will be and hence the greater the likelihood that a new entrant will seek to enter.

I will now examine each of the four basic activities according to these five criteria and suggest the likely development of competition in the market in each of these functional areas.

Interaction with the environment

There are limited sources of raw water and the Water Framework Directive is likely to make their exploitation more costly. Similarly, continuing tightening of environmental standards is likely to limit opportunities for the discharge of treated or partially treated effluents. Entry into the market is therefore going to become increasingly difficult. This is the rationale behind the proposed trade in abstraction licences in England and Wales. It does not seem fair from the customer perspective, that extra cost is incurred because an abstraction

licence is not required by one supplier but is not made available to a competitor. There may also, however, be other significant costs associated with entry to this market - either in constructing an outfall or in developing infrastructure to make use of a raw water source. This barrier may not be so significant from the viewpoint of a major industrial user of water. Liquidity in any market is, however, likely to be limited.

This is because there are no substitutes available. Water has to be taken from the natural environment and ultimately has to be returned after use. There are no viable alternatives either in sourcing or in the removal of waste.

The influence of the purchaser of raw water is limited by availability of the source. In Scotland, the relative abundance of raw water sources will mean that buyers may be able to exert some influence, whereas in the South East of England, the limited number of sources would significantly limit the influence of buyers. This influence is further limited, throughout the UK, however, by the availability of infrastructure to exploit the resource and by regulatory restrictions. The cost of transporting water and the regional nature of infrastructures will also limit the influence of the buyer and the seller.

The barriers to disposal of treated effluent are primarily regulatory but there is also an infrastructure/capital barrier. In this sense it is very similar to water abstraction. Again, as with water abstraction, there are no meaningful substitutes available.

Theoretically, the buyer of effluents for disposal may have significant influence over the supplier. This is because of the constraints of regulatory controls and limited infrastructure. The extent of the buyer's influence would depend on the degree of control over discharge consents and on the state of the local infrastructure. The Competition Act would likely limit this influence under the provisions concerning an abuse of dominant position. The buyer would have to offer a fair price for the service provided.

Competition in abstraction rights or discharge is only likely to develop in parallel with competition in the production and treatment function. This is because the usefulness of these rights is limited by demand for services. If competition develops in the treatment of water and/or effluent, then there is likely to be increased competition for the scarce resources discussed above. Otherwise there would seem to be little, at least in the Scottish context, that would stimulate any degree of significant competition.

If retailers saw potential competitive advantage in capturing more value from the production and abstraction processes, then competition may develop through 'common carriage'. It would, however, involve major diversification for a pure retailer and, as such, that would be a commercial risk. It would seem likely that they would seek a specialist partner if this were really to present an interesting business opportunity.

Production and treatment

If supply and demand for treated water are in balance, there is little reason to expect a new entrant to be attracted to offer his services. The regional balancing of supply and demand will also limit the attractions of adding significant production capacity. The only reason to expect entry would be if the new entrant felt that he could provide the product at a lower unit cost. This may result from either greater operational or capital efficiency or from design/ technology efficiencies. The payback in a normal efficient market on any production investment is, however, likely to be quite extended.

In a limited number of cases, opportunities may be presented to a new entrant either because there is an excess of supply or of demand. If existing supply is too great, there may well be an opportunity to build a lower unit cost solution. If there is excess demand, the new entrant may be in a better position to exploit this opportunity than the incumbent.

The influence of buyers is limited. Even if there were only one buyer because there is no competition at retail, Competition law would appear to prevent the single retailer favouring its own producer at the expense of a new entrant, if the latter were offering a lower price. In general terms, the dynamics of effluent treatment are the same as for the treatment of raw water.

There are limits to the development of competition in water treatment, which arise from the access to raw water (at the site for treatment) and access to a market. This issue is not addressed directly by abstraction licences.

Real liquidity in the market is limited by externalities and it may be impossible sufficiently to ring fence the natural monopoly to have real competition.

There are a few cases where competition could be presented to an incumbent producer of treated water or effluent. The large user of water or discharger of effluents may represent an opportunity to a new entrant. This could involve the construction of an on-site effluent treatment facility or an infrastructure to supply raw water or to recycle water. In some instances these investments may be economically justified, in which case they should progress. In other cases the perceived benefit results from an incorrect allocation of costs and hence the establishment of an uneconomic price. In the latter case, it would be better for customers in general, if the incumbent were to review its costs and pricing in order to retain the customer.

The treatment of sludge shares many of the business drivers of water treatment described above. Only a technological innovation is likely to stimulate new entry into this market, if demand is being satisfied, the service is being provided efficiently and a 'normal' return is being earned.

Networks

If this natural monopoly is efficiently managed, a fair return will be available on a consistent basis. Excess returns are limited by regulation and by the provisions of the Competition Act. The water and sewerage network is an essential facility and, therefore, there is a requirement on the owner to make excess capacity available at a fair price.

Retail of treated water

As discussed above this is a quite different activity to the other processes involved in the supply of water and sewerage services to customers. There are barriers to entry although these may be more apparent than real. The barriers surround knowledge about customers, information and billing systems, and the intellectual property required to deal effectively with customers.

At the current time the Scottish water authorities have a contract with the local unitary authorities to bill domestic customers for their water and sewerage services. If the potential entrant were already involved in the supply of services to customers in Scotland, it may be relatively straightforward to begin to offer these customers an additional service - water. This new entrant may well already have the information systems, knowledge of the customer base and reputation to be a credible choice for customers. Even in the non-domestic arena, where the water authorities already bill customers, alternative offerings may be attractive to customers on either convenience or price grounds. Similarly, potential entrants who already have a relationship with the customer through supplying a different service and who have the knowledge management systems to deal effectively with customers are likely to enjoy some success.

Table 11.3 summarises the discussion above.

g) Likely types of competition in the market

There are two broad types of in the market competition that are likely to develop: brokerage/retail and common carriage.

i) Brokerage/retail

A brokered deal arises when the customer deals with a retailer, who is not responsible for anything other than the final supply to the customer's premises. The broker would typically handle issues such as billing and all aspects of customer service. Many issues, such as supply interruptions would be dealt with by the broker who would deal with the third party network operator or generator. Brokerage will work where economies of scale or scope exist within the customer interface area of the value chain.

Scale economies result if the marginal cost to the new entrant in providing the service is very low because of unused capacity in its customer services/billing infrastructure. Scope economies could arise when the broker is already billing the customer for one or more other products. For example, if a household customer is already buying a telephone, electricity and gas service from Scottish Gas, it is very likely that the marginal costs to Scottish Gas of offering a retail water service would be much lower than those of the water authority. An opportunity for brokerage could also result from significant relative inefficiency in the delivery of the retail service to the customer. In the non-domestic sector at present, the most common rationale for a brokerage arrangement is to take advantage of imbalances between fixed and variable elements of tariffs or inefficient water use by the customer.

Table 11.3: Likelihood of competition across the functional value chain

	Ease of Entry	Substitutes	Buyer power	Supplier power	Current competitive dynamic	Likelihood of competition 'In the Market'
Water abstraction	Low	None	Low	N/A	Low	Low (except under common carriage)
Water treatment	Medium	Domestic - None Non-domestic – Yes	Domestic - Low Non-domestic – Medium	High	Low	Medium for non-domestic customers. Otherwise, low (except common carriage)
Treated water distribution	Very low	None	Low	High (Competition Act)	Low	None. Essential facility rules will apply
Retail of treated water	Very high	None	High	None	Low	Likely to be significant
Waste water collection	Very low	None	Low	High	Low	None. Essential facility rules will apply
Waste water treatment	Medium	Domestic - None Non-domestic – Yes	Domestic - Low Non-domestic – Medium	High	Low	Medium for non-domestic customers. Otherwise, Low (except common carriage)
Disposal of treated effluent	Medium	Domestic - None Non-domestic – Yes	Domestic - Low Non-domestic – Medium	High	Low	See waste water above
Disposal of sludge	Medium	Domestic - None Non-domestic – Yes	Domestic - Low Non-domestic – Medium	High	Low	See waste water above

Brokerage proposals were possible prior to implementation of the Competition Act. There are relatively few examples of brokerage arrangements, but their impact has in some cases been quite significant. In most cases these arrangements have started because of the method of setting tariffs rather than as a result of any concerted attempt to benefit from potential economies of scale and scope.

It is likely that the uncertain prospects for prices have significantly slowed the introduction of brokerage deals for customers. The potential providers of these services would not want to tarnish their hard won reputations with the sort of price rises that have characterised the water industry in recent years. Inevitably, however, as we move to a more financially sustainable industry, there will be a greater likelihood of customers being offered services by an alternative provider. This opportunity is not a function of the Competition Act, 1998 - it could and probably will happen, irrespective of the approach of policy-makers to the Act.

ii) Common carriage

This is the one new opportunity for competition that is made possible by the Competition Act, 1998. The 1998 Act contains two provisions: Chapter 1, which relates to price fixing; and Chapter 2, which covers the abuse of a dominant position in the market. It is Chapter 2, the abuse of a dominant position, which is relevant in this context.

The Act introduces into UK law the concept of an 'essential facility'. An essential facility is defined as an asset that it is not economically viable to replicate. A new entrant to a market must be provided with an opportunity to use this essential facility if there is capacity available and if a fair charge is paid. From the perspective of an incumbent, it is particularly important that the fee for use of the asset is set at a level which can be justified and which reflects the full costs of use. The new entrant would have a right of appeal to the Office of Fair Trading in the event that the charge for access were too high. If the price for access were lower than the full costs of operation, the new entrant is likely to accept the price without comment.

The essential facilities in the water industry certainly include the underground infrastructure - the miles of pipes that convey water from the treatment works to homes and businesses and effluent from homes to sewage treatment works. It is also quite likely that certain water and sewage treatment works will be regarded as 'essential' because replicating these may not be either economically or practically possible. This would include, for example, works that serve densely populated areas.

Common carriage provides the opportunity for more of the value created in the provision of water and sewerage services to be captured by the new entrant. The new entrant, as discussed above, is already able to offer a brokered service to customers. Common carriage will enable the new entrant to abstract and treat water and arrange for this to be entered into the distribution system. If the new entrant is able to abstract and treat this water at lower cost than the incumbent, this will result in either the new entrant being able to reduce its retail prices (and, therefore, the attractiveness of what it is offering to customers) or increase its profitability. The incumbent will be left with higher unit costs for treatment and will therefore face a choice of increasing its prices (if possible within the regulatory price cap) or accepting lower profitability.

The attractiveness of common carriage depends upon liquidity in the market for water abstraction and treatment and sewage treatment and disposal.

While tradable abstraction licences would ensure easier access to resources, this does not necessarily facilitate in the market competition in water treatment. There are significant barriers arising from having to ensure access to resources at the point of treatment. On the water side, this is likely to reduce competitive options significantly and, quite possibly, the attractiveness of common carriage.

On the sewerage side, there may be more options to site new plant next to sites where discharge consents are likely to be available. Common carriage through the collection network may, therefore, have attractions. However, the technical and capital requirement barriers to entry should not be underestimated in any assessment of the development of common carriage.

The dynamic of common carriage could well be changed quite fundamentally if the incumbent is either inefficient or has inaccurately allocated costs to network activities. In either of these cases, value would be captured opportunistically and common carriage could be attractive.

h) Revenue vulnerability from in the market competition

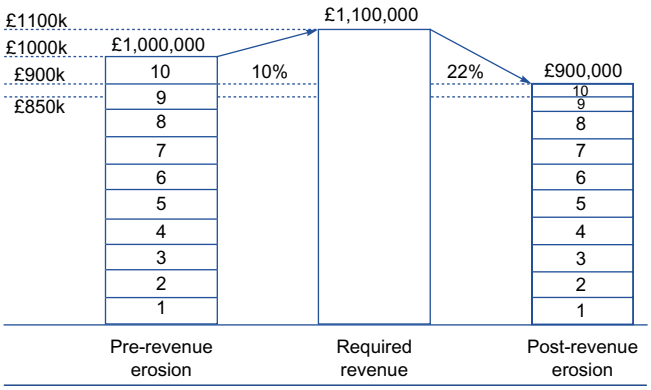
i) Impact of in the market competition on the incumbent supplier

The impact of "in the market" competition on the incumbent supplier will largely depend upon the extent to which brokerage, common carriage and off-network solutions develop. Each of these will result in a loss of revenue to a greater or lesser extent. The regulatory cap on revenue is therefore likely be exceeded by the increase in prices required by the regulated incumbent in order to raise the revenue agreed.

The following simple example demonstrates. Let us assume that there is a water only business which has ten customers, each of whom pay £100,000 a year in volume based water charges. The total revenue of this small water business is £1,000,000 a year. If the agreed regulatory revenue cap is 10%, the water business is allowed to raise £1,100,000 in year two. If two customers decide that they want to opt for an off-network solution, which will satisfy half their requirements, then there is a decline in the chargeable base of (2 x £100,000 x 50%) = £100,000. The chargeable base therefore becomes £1,000,000 minus £100,000 or £900,000. If the incumbent still needs to raise the full £1,100,000 in order to deliver the

standards of service required, then the price (tariff) increase on all remaining customers is (£1,100,000/£900,000) or 22.2%, rather than the 10% implied by the revenue cap.

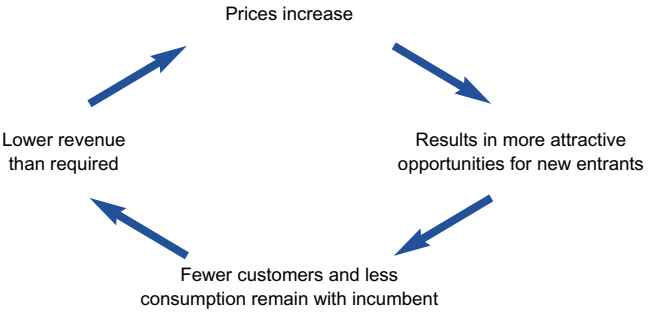
Figure 11.6: Example of revenue erosion and impact on remaining customers



The impact on revenue can be made worse according to the elasticities of demand, supply and substitution. The price elasticity of demand depends upon the variability in the absolute quantity demanded at any particular price. If the quantity declines less quickly with an increase in price, total revenue will increase. If quantity declines more quickly, then revenue will decline. In most cases - given the current lack of competition, the incumbent will find a relatively inelastic demand curve, i.e. one where the impact of a price rise on the quantity demanded will be relatively modest - at least in the short run. It is important to note that the quantity demanded equals the number of customers multiplied by the average total volume of water consumed. That is to say the quantity demanded will depend both on the number of customers and on the consumption of each customer. It is therefore possible that revenue could fall, even if the total number of customers remains the same. This would be because the average volume consumed by them falls. The demand curve can be made more inelastic by increasing the fixed element of the charge.

The higher price may have secondary (long run) effects. If the higher price were to attract a new entrant into the market whether on a common carriage, brokerage or off-network solution basis, then the customer may find that some or all of his demand can be met at a lower price. The result would be to increase the price elasticity of demand. Greater tariff increases would then be required to reach the required level of revenue. This results in a cycle of doom: higher prices, which lead to growth in the number of alternative supplies, which leads to lower total demand and lower than required revenue and consequently a need for higher prices.

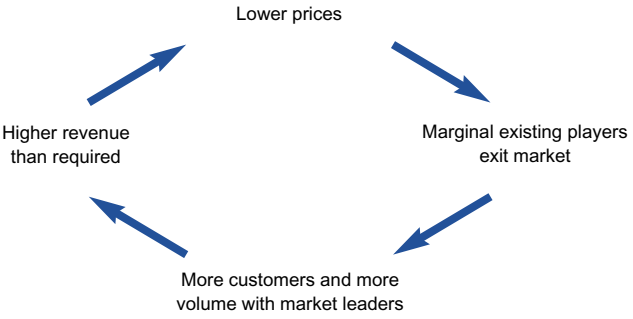
Figure 11.7: Higher prices



In a competitive or, at least, a non-monopolistic market, this cycle can work in reverse. If, for example, efficiency or innovation were to allow an incumbent to reduce prices, then a positive chain reaction can be set in motion. Lower prices can lead to less attractive competitive options, which leads to higher demand and consequently higher than expected revenue and hence the opportunity to cut prices further.

It is important to understand that a vertically integrated operation comprises of a number of separate and essentially discrete activities. In many industries vertical integration was the norm, but greater specialisation, limits on available capital and improved technology have resulted in a reduction in the extent of vertical integration. Some types of competition may impact on the whole value chain, while others will be relatively restricted in their impact (e.g. impacting only on customer interface activities).

Figure 11.8: Lower prices



ii) Brokerage

Brokerage will only impact on the revenue which accrues to the supply or retail business. Its impact on the whole vertically integrated business of the water authority will be relatively limited. This will equal the total costs incurred plus the margin that is determined by the competitive marketplace. The margin may be negative if the costs incurred are higher than those that can be achieved by an efficient supplier. Total costs are the sum of the variable costs associated with each customer (for example, the costs of producing an extra bill) and the fixed costs of being in the water supply business (office space, information and billing systems etc.).

The high ratio of essentially fixed costs will result in unit costs per customer falling sharply as their numbers increase. It will also mean that there are certain critical thresholds, at which it is attractive to be in or out of the supply business. Loss of a customer - especially a major customer - is likely to have a major impact on the retail/supply business. However, loss of even a major retail customer (assuming that they are still supplied by the vertically integrated suppliers' network) will have only a marginal effect on that vertically integrated supplier's business. The actual economic impact of the loss of a major customer at retail is discussed in Chapter 13.

iii) Common carriage

Common carriage activities would potentially pose a larger threat to revenue than brokerage (to the extent that water treatment or sewage collection costs could be avoided). As the distribution (pipes) business is a natural monopoly, if it is efficiently run, the price of use will equal the cost of use plus the return required to invest properly in maintaining the serviceability of the network. Common carriage should therefore impact only on the revenues associated with the abstraction and treatment business and the retail/supply business. It could have a more material impact on the vertically integrated authority. The impact of common carriage on the incumbent can be reduced if the incumbent strives to achieve the minimum sustainable unit cost of treatment and abstraction.

i) Off-network competition

i) Definition of off-network competition

An off-network solution for a customer is one where the customer is able to reduce his dependence on the public water and sewerage system. This may be partial or it could be more significant.

The vast bulk of water distributed to large user, non-domestic customers is used for non-potable purposes. For example, the water may be used for cooling, for conveying goods (e.g. fish processing, cement production) or for cleaning. In these circumstances, potable water may not be required, indeed it may not even be the ideal solution to the user's needs. There are some industries that have to clean the water further and remove the chemicals that have been added to water to ensure that it is safe to drink, for other industries sea water would actually be preferable to potable water.

Faced with increasing bills, some customers will inevitably seek ways to reduce their bill. At present there are two ways in which a bill could be reduced: firstly to use less water from the public system; or secondly to consider abstraction from rivers or canals, abstraction from the sea (in the case of fish processors), recycling of water and/or the use of a borehole. Each of the latter solutions are likely to have potentially significant capital costs and/or implications for the potential discharge to sewer and therefore on the trade effluent bill.

The situation is similar for effluent treatment. There are opportunities to treat effluent on an industrial site prior to discharge to the public sewer or through an outfall with an appropriate consent. Such pre-treatment may avoid a significant proportion of the effluent charges that would be levied by the water authority or, if a consent were available, potentially all charges would be avoided.

There are several examples where this type of pre-treatment has been introduced. It has been estimated that £100 million has been spent over the past five years by the chemical industry alone[8] in seeking solutions that would lower effluent treatment costs.

These off-network solutions are the most common existing form of competition. They are currently more common on the effluent side, but are beginning to be introduced on the clean water side as well. In reality, these have been available for many years and the recent acceleration in this type of arrangement

[8] Source: Chemical Industries Association Large User Forum – 27 November 2000.

again has nothing to do with the Competition Act. It has far more to do with the increasing costs of water and increased restrictions on discharges to the environment.

ii) Key success factors

There are only a very few customers who would prefer to be off-network. In meetings with large customers a clear message has come across that cost has been a major factor in promoting off-network solutions.

A market for off-network solutions will only develop if the costs - to the customer - of these solutions are lower than the prices charged by the public supplier. At the current time, one of the easiest ways in which a water bill can be reduced is to reduce consumption of the product. The large proportion of any bill that is charged by volume makes these savings possible. There has been a consequent increase in consultants who specialise in water management, offering their services to industrial and commercial customers.

Some larger customers are located near to a water source or may have access to a discharge consent for effluent. In these circumstances, the customer may be able to reduce their bill to the water authority by capitalising on their location. In order to be a realistic option the whole life costs, when annualised, would have to be lower than the price, which the organisation would have paid for the services that are replaced.

iii) Likelihood of development

At the current time, this off-network competition represents a quite significant threat to the revenues of the Scottish water authorities. There are four principal reasons for this:

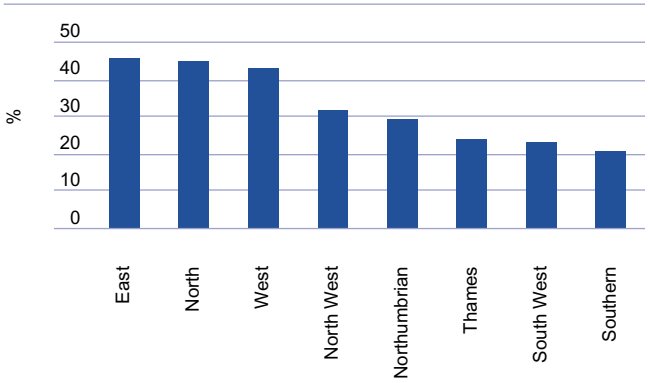
- the greater revenues paid by the non-domestic sector in Scotland,
- the method of charging,
- lack of understanding of the incidence of costs,
- lack of service to customers.

I will discuss each of these in turn.

Non-domestic share of revenue

The non-domestic sector pays a greater share of total industry revenues than in England and Wales. This is illustrated in Figure 11.9.

Figure 11.9: Non-domestic percentage of total revenue 2000-01[9]



There is little reason to believe that there should be as marked a difference between Scotland and the rest of the UK. This does not, however, necessarily mean that the balance in Scotland needs to swing as far as in England. While Scotland does have a relatively high share of process industry (chemicals, paper, electronics), such industry does tend to be less concentrated (and therefore more expensive to supply) than in other parts of the UK. It is also possible that in England the threat of an inset appointment has reduced prices to the larger non-domestic customers. The large volumetric component of customer charges in England and Wales is also likely to reduce the size of bills for the non-domestic sector where alternatives to potable water are available. There are also some issues about the relative prices to some small businesses in Scotland, who appear to benefit from the current tariff regime.

Unfortunately, at this stage, there is insufficient data to be able to assess the fully-loaded costs of supply for major industrial customers. There is, therefore, some considerable work still required before a broadly cost-reflective price for the service provided can be offered. It may be that Scottish Water or the existing three authorities may be able to present clear evidence that their costs of supply would justify increasing domestic charges relative to non-domestic tariffs. Until there is clear evidence, I would propose that no such adjustment be made.

As companies seek to control costs, they will inevitably look at costs that are increasing and at costs which, when benchmarked against the costs incurred at other sites, look to be excessive. This will mean that water charges are likely to be more visible as an issue in Scotland than in other regions of the

[9] Source: Companies' Ofwat Tariff Structure 1999-00, Authorities' Charges Schemes 2000-01

UK. The level of charges in Scotland is, of course, more visible because of the relative inefficiency of the local supplier.

Method of charging

The current method of charging for water and sewerage would also appear to be contributing to the development of off-network competition. The most simple example is where a reduction in water use can lead to a significant fall in the bill to the customer. If this is not mirrored by a fall in the costs of supply, then the difference will have to be met by other customers. This would be a serious issue if the costs of supply were to exceed the total price charged to the customer.

There are basically three discrete services that are provided to the customer. These are:

- access to the public network,
- treated water,
- customer service and billing.

Value is created by the connection of a property to the water supply. The most obvious example is that land for development that is already connected to the water mains will sell for more than identical land, which is not connected. The extent of the use of that pipe is a secondary factor. It is believed that a pipe that is in use on a regular basis may actually outlast a pipe that is rarely, if ever, used. The connection therefore has value in its own right. This is the rationale behind the cost component relating to access to the public network. The same would apply to a connection to the public sewer.

Raw water may well fall from the sky, but that does not mean that it is free. There are environmental costs associated with the abstraction of water, although at the current time these have not been established in monetary terms. The treatment of water and the transport of that water through the pipe to the customer can be expensive. There are the capital costs associated with the treatment plant and the connection to the raw water source; and there are the operating costs associated with manpower, chemicals and energy used to treat the water, make it safe and pump it along the pipeline to the customer. Some of these costs are fixed (the capital costs and the manpower), others are more variable (the energy and the chemicals). It would be proper that customers' bills reflect these variable components. However capacity reserved for an occasional user should incur a fixed charge.

The same economics seems to apply to the provision of sewage treatment facilities. The largest element of cost is the capital and manpower, then there are the power and sludge disposal costs, which will tend to be variable. If the tariff has too large a variable component then customers who are unable to limit volumes will be unfairly penalised and will have to contribute more than their fair share. An example would be a customer who uses an increased amount of water for medical reasons but does not require any different supply infrastructure.

The customer service charge reflects the billing costs, the customer service (call centre, key account manager, publications) and, if appropriate, the meter operation and reading costs. These costs will be relatively fixed in nature and will not vary a great deal according to the use of water by the customer. They will obviously be higher in absolute terms for a large customer who merits a more personalised service, but in proportion to that customer's total bill, they will be small.

The current balance between the fixed component of the charge to a customer and the volumetric component do not appear to reflect the economics of the service that is provided. The current fixed charge tends to be from 0.08% to 18.0% of the typical large customer's bill. It has been estimated that the monopoly fixed costs are at least 66% of the costs of supply. This does not include the fixed cost component of water and sewage treatment capacity. If the latter is included, this fixed element is likely to exceed 85%.

Incidence of costs

Limited understanding of the incidence of costs can result in off-network solutions that are not economically sensible being developed by customers, and not being responded to by incumbent supplier. One clear example of this occurred in 2000, when fish processors in Aberdeen were close to opting out of the public sewerage system and building their own effluent treatment plant. Whilst the effluent treatment plant would have reduced their costs by a not insignificant margin, these costs were materially higher than those incurred by the

incumbent water authority. It was therefore possible to structure a deal that was beneficial to the incumbent water authority, the fish processors and to all other customers of that authority.

I believe that a proper understanding of costs is absolutely critical to the management of the water industry in Scotland. This will not only facilitate their drive for efficiency, but will also ensure that the threat posed by competition is only real where genuine economic value is being created.

The key factor in understanding when there is an economically rational case to pursue an off-network solution is to understand the costs that will be incurred in the solution and the costs of supply of the incumbent. In particular, the customer must understand all the costs that are being incurred, including those (for example, senior management time), which it may be difficult to assess in monetary terms.

In addition to the capital costs, the customer ought to make an assessment of the potential environmental constraints, which may limit the pay-back period on the capital investment. There also ought to be a proper costing of the risks associated with security of supply in the longer term and exposure to environmental regulation risks.

If the supplier is to understand the risk of competition, he must understand the real costs of supply to all major customers and ensure that the prices offered to these customers do reflect the true costs of supply. Perhaps most importantly, the supplier should understand why a customer should want to seek an off-network solution.

Lack of customer service

I will discuss the issue of customer service in more detail in Chapter 22. At this time, it is useful only to note that key account management is at a very early stage of development in the water industry in Scotland. Only East of Scotland Water Authority has made a significant investment in relationship management with customers and this is quite recent. This has limited the understanding of the authorities' managers of the issues, which concern customers. In addition, the authorities' poor performance in billing will also have reduced the confidence of the customer in their supplier and, given the lack of competitive choice, some customers, almost inevitably, may have felt forced into a situation where they pursue an 'off-network' solution.

iv) Likelihood of off-network solutions - summary

There are significant economies of scale in the construction and operation of sewage treatment works. It should, therefore, not be possible for an industrial site to develop and operate its own works more efficiently than the specialist service provider. The economic incentive therefore has been created by the tariff regime and potentially by significant inefficiency. The tariff must have been set at a level so significantly in excess of true economic costs that the relative inefficiency of small scale (and a higher cost of capital for a private sector, non-specialist operator) has been overcome. This incentive should be removed in order that the public system is used to its full safe and sustainable capacity so that overall unit costs are minimised. The only exception to the incentive being a result of tariffs and / or inefficiency may be when there is a real capacity or development constraint. Even in this circumstance, however, there is likely to be a better solution both for customer and service provider if they work together to find it.

Abstraction from rivers or boreholes may represent a cheaper source of water than the potable public supply. However, if the full costs are taken into account (and especially the regulatory risks), these solutions will, almost certainly, appear less attractive. It is likely to be in the general customer interest if the supplier and customer work together to find a viable solution. It is, therefore, vital that the public service provider does not feel constrained in dealing with the customer, because this would be an open invitation to a competitor to 'cherry-pick'. This is not an invitation to strike any deal - but to strike a deal that is in the best interests of all customers. It is not clear how, from a broader customer perspective, off-network activity could be beneficial.

The only area where off network solutions are likely to be at all attractive is where a customer does not need potable water. Although the attractions in such cases will look a lot more modest after a full assessment of the costs and risks has been made, there may still be an advantage in pursuing the opportunity. In these cases, it will be important to look at the pricing and cost of a supplier of last resort service.

v) Supplier of last resort

For those customers who require a guaranteed supply of water and can at best tolerate only a short interruption to supply, this supplier of last resort service will still be required - even if the bulk of their needs can be met through an "off-network" solution.

It is possible for a non-domestic customer to decide that they are prepared to opt out of the public water and waste water system. This could happen, for example, if a producer has access to a long sea outfall and there is not believed to be any real likelihood that the necessary consent to discharge could be withdrawn.

In most cases a non-domestic customer who is an essential user of water is likely to want to be certain that they could reconnect to the public system if required. In some industries water is essential to safety or to continuing production. In these cases, there may be overwhelming economic reasons or regulatory reasons why a connection to the public system would have to be maintained. If a continuous process has to be shut down, even for a short time, the costs in lost production and management time can be very significant and could easily dwarf the annual water charge.

Customers for a supplier of last resort service will divide into two main groups:

- customers who want a service on demand from the water authority;
- customers who want to be able to reconnect within a reasonable timeframe, but for whom an on demand service is not essential.

Customers who require an on demand service will retain a close relationship with the water services provider, even if they go off-network for all their day-to-day use. If an on demand service is to be provided, the authority would have to maintain the supply (or collection, in the case of sewerage) infrastructure in a condition that would allow this service to be provided, if and when required.

The customer would not use any water (or discharge effluent) in normal circumstances. If, therefore, the supplier of last resort service could be provided on demand by reconfiguring supplies, there may be minimal, if any, charges for the treated water. However, if a customer needs capacity to be maintained "just in case", then there would be a cost, which should be borne by that customer.

There would also be a customer service component to the maintenance of an on demand supplier of last resort service. There would certainly be administrative costs that would be unique to this sort of relationship, and there would still be billing costs and costs associated with ensuring that contact is possible.

The charge for the on demand supplier of last resort service would contain access, treated water and customer service elements. It would seem likely that this service may prove to be quite expensive for a customer. This would be especially true, if unused capacity has to be reserved just in case it is required. There may be some circumstances where network management may reduce the amount of infrastructure that has to be reserved, and this would clearly reduce the costs to the supplier and hence price to the customer. It will be a matter for discussion between customer and supplier, but the lack of a national grid, unlike in electricity and gas, certainly limits the options for network management - at least in the "on demand' scenario.

The second circumstance would arise where a customer could survive for a period of days or even weeks without a water service. This may be because water is not critical to their process or because the costs of shut-down are limited. A supplier of last resort service may not, in this case, require infrastructure to be reserved just in case the customer should decide to call upon the service. With time there will be other solutions that can be offered to the customer. The supplier and customer will have to agree the exact terms of the service to be offered and the costs would be calculated to reflect the level of service. It would obviously be cheaper than the on demand service.

vi) Impact on revenue

Off-network solutions will have the greatest impact on the revenue of the vertically integrated water authority from any single customer. It is possible that such solutions could lead to the loss of all revenue associated with the provision of that service. Total loss of any customer's revenue would result if no supplier of last resort service were provided.

If a company chooses an off network supply for its water needs (and rejects the supplier of last resort service), this could result in loss of revenue for the retail/supply business, the distribution (pipes) business and the treatment and abstraction business. This would have the effect of increasing unit costs and reducing profitability across all activities of the water authority. The consequent impact on the authority in this instance is much more severe than would be the impact on the supply/retail business of a similar customer switching retail suppliers.

The key success factor for the supplier is a proper understanding of costs and of the services being provided to the customer. This will allow properly informed discussion between supplier and customer and will result in a fairer price for the service being provided.

j) Potential implications for the Scottish water industry

The Scottish water authorities are relatively inefficient. There is no evidence to suggest this inefficiency is limited to particular areas of the vertically integrated functional value chain or that asset management is significantly better than operations. This would suggest that each of the broad activities outlined above i.e. production, distribution and retail, will be relatively high in cost in comparison to competitors.

Retail is, however, likely to be worst affected. There are two reasons for this:

- Firstly, the one area where the performance of the Scottish water authorities is notably worse than other potential competitors is in the area of collection of revenue from customers (particularly from the domestic sector). This is a cost that would exclusively apply to the retail business.
- Second, many of the potential competitors in the retail arena are likely to be able to benefit from economies of scale and scope, which is likely to mean that their unit costs per customer are lower than those of the Scottish water authorities.

The likely consequence of these factors is that competition for retail customers is likely at some point in the future to be intense. Ironically, the uncertainties around the pricing implications for the industry over the long term will have, to date, restricted this competition. This uncertainty represents a window of opportunity and it would be vital that the Board of the proposed Scottish Water seize this in order to ensure that the broader customer interest is safeguarded. The only option that would appear closed is that of the Scottish industry handling its own domestic billing and collection. It is highly unlikely that the required investment could be recouped, or indeed that customer service would reach the levels achieved by other options.

The distribution business is a natural monopoly, which, as such, will always require some degree of regulation. The key success factor will be that management are able to set and justify a fair economic price for use of the network. This will no doubt have to take into account the costs of other network operators. If the incumbent operator is efficient and has allocated his costs accurately, no issues will arise. If, on the other hand, the operator is inefficient or has misallocated costs this would result in the price of access being set at a level below the actual cost plus the necessary return that is required by the incumbent to maintain the network in a serviceable condition. In other words, the incumbent can only continue to provide an adequate service if it finds a way of reducing costs such that it can continue to invest in maintaining the network. If the incumbent fails to identify efficiencies or continues to misallocate costs, the overall performance of the network will begin to decline. This decline would result in the fair cost of access falling and consequently even less revenue being available to the incumbent. Unless efficiencies were found to compensate, less resources would result in an accelerated decline in the performance of the network. This is asset stripping and clearly not in the interest of today's or future customers.

Ultimately, if the incumbent is not prepared to take the steps necessary to become efficient, then the owner of the infrastructure (in Scotland this is the Scottish Executive) would need to take action to ensure that the value of the assets to all customers is maintained.

The treatment/abstraction business may be subject to in the market competition when a common carriage licensing system is in place. However, it is not at all certain that the lack of the national network and the intrinsically local supply infrastructures may not limit these opportunities significantly. In any event, success in a competitive market will require unit costs in each

separate location to be minimised. In most cases this will require better management of capacity and, over the longer term, better sizing of assets to the needs of the business. Currently, there are assets where capacity utilisation is relatively low. In these cases, it would be appropriate to price according to the long run marginal cost of production in the area and, to the extent that the existing asset was oversized, recognise the financial loss.

For the market competition may play an increasingly important role in ensuring that value for money (i.e. a better service at a lower cost) is made available to customers. Contracting out of services so that management has an opportunity to compare the performance of a contractor with their own internal performance is likely to be a catalyst in improving overall efficiency significantly. These comparisons will, however, only be workable if there is sufficient attention paid by the Board to the allocation of costs across the activities of the organisation.

k) Impact on customers

Competition should normally benefit customers. It may or may not benefit the incumbent supplier. Customers will benefit through greater choice, lower prices and better levels of service. It is vital that the incumbent understands the way in which competition can occur, the impact of this on revenue and the incidence of his costs of supply, if he is to be successful. Responding effectively to competition will be primarily about addressing the issue of cost. If the Scottish water industry can approach the efficiency frontier, there will be little to worry about outside the retail sector. The next two chapters look at the limited revenue implications for the Scottish water industry and then the essential issues to be addressed if the authorities are to ensure they have a proper understanding of costs.

Section 3: Chapter 12
Competition: Background to the Utilities Sector

a) Introduction

The previous chapter discussed how competition might develop in the water sector. It concluded that there is a significant element of natural monopoly and that there are other constraints (e.g. the lack of a national water grid), which will limit the amount of competition in the market. The exception to this is retail activity, where competition is likely to be significant and scale and scope economies are likely to be essential for success.

Significant competition has developed in the electricity and gas sectors over the last few years. This competition has been primarily in the retail sphere or in exploration/ generation. The market for support services, such as meter reading, has also become competitive. The natural monopoly elements of both electricity and gas have become increasingly tightly ring-fenced. Regulation has forced the natural monopoly businesses to become much more efficient in terms of their operating and capital costs. The gas and electricity industries have therefore gone through a period of dramatic change over the last decade, driven principally by the policy objectives of successive governments.

The utilities were at the forefront of the privatisation agenda in the late 1980s and early 1990s. New regulatory structures to provide accountability were established. The monopolistic nationalised industries were transferred to the private sector, underwent significant restructuring, and had their markets opened up to competition. The result in both electricity and gas has been the same: industrial, commercial, and domestic customers now have a choice of suppliers. The journey to this competitive marketplace has, however, been different in each case. This chapter provides an overview of the transition to the competitive market in these industries and the extent to which the former vertically integrated monopoly activities have become competitive. It continues with a review of the failures of liberalised markets and concludes with a summary of the key success factors. This summary will confirm the hypothesis of the previous chapter that competition in the market can only develop in areas demonstrably separable from the natural monopoly. In other areas, the customer interest requires regulation to ensure that costs are kept to the minimum sustainable level.

b) The introduction of competition into the gas industry

Like the water industry, there was an element of competition in the gas industry for several years prior to its privatisation, and certainly long before competitive choice became a goal of regulators and government. The largest users (those using over 25,000 therms per year) had a choice of suppliers. This right was confirmed in the Gas Act 1986, which principally provided for the privatisation of British Gas. The commercial and industrial gas supply market was fully opened up in the late 1980s. By 1998 there was full competition in the gas industry for commercial, industrial and domestic customers.

The development of competition in the gas industry went through several stages and is summarised in Table 12.1.

Table 12.1: Development of the gas industry 1982–98

Date	Development
1982	• Large users (over 25,000 therms) allowed to use alternative suppliers after Oil and Gas (Enterprise) Act
1986	• Privatisation of British Gas (BG) as a single vertically integrated entity, covering production, distribution and supply. The Gas Act also enhanced previous legislation, which allowed large users to use other suppliers
1988	• Monopolies and Mergers Commission (MMC) finds British Gas has abused its dominant position, particularly with respect to large users. British Gas was required to produce price schedules for large users, and to publish standard common carriage terms.
1992	• Competition and Service (Utilities) Act gave regulator, then Ofgas, a duty to secure competition in the industry and lowered the competitive threshold to 2,500 therms/year. Within 3 years, British Gas' share of the competitive market had fallen to 20%.
1993	• Second reference to MMC led to proposal that BG should divest itself of trading activities by 1997, with an accounting separation of the business by 1994. Secretary of State accepted a compromise, allowing all activities to remain part of BG, conditional on full accounting separation and open access to the entire gas supply market by 1998.
1995	• Gas Act 1995 amended the 1986 Act to allow the creation of an industry structure comprising public gas suppliers, public gas transporters and gas shippers.
1996	• Introduction of Network Code, providing procedural infrastructure for open access to the network. Phase 1 pilot of domestic competition. British Gas announces demerger into BG plc (incorporating Transco, public gas transporter) and Centrica (whose subsidiary, British Gas Trading – BGT – acts as gas supplier).
1997	• Domestic competition phase 2 pilot.
1998	• Full domestic competition.

The Office of Gas and Electricity Markets (Ofgem) now regulates the gas industry through a licensing regime established by the Gas Act 1986 and amended by the Utilities Act 2000. The Act describes the three activities to be licensed:

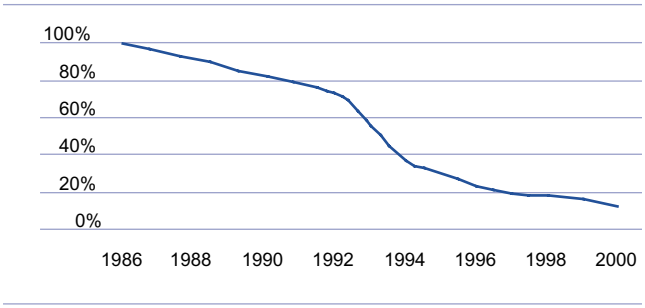
- gas transporter,
- gas shipper, and
- gas supplier.

Gas producers[1] (eg from the North Sea and Irish Sea) compete with one another to sell gas to the shippers. Shippers then arrange for the gas to be transported to a supplier. Almost the entire transportation network in the UK is owned and operated by Transco. As a monopoly, Transco's revenue is regulated by Ofgem, which sets a revenue cap for the company. Finally, the gas supplier provides the interface with the customer. The supplier will be the company that bills customers for the gas they use and for other services such as handling the customer's account, reading the meter, transportation and storage of the gas.

Up until now, British Gas Trading's supply prices have been regulated by Ofgem, due to its continuing dominance in the domestic supply market. Controls are still applied to late pay and prepayment tariffs. However, it is expected that these price controls will be phased out in the near future, as the domestic supply market becomes fully competitive. The regulatory regime requires all stages of the supply process to be licensed as separate activities. In practice, a large conglomerate may be involved in exploration, transport, shipping and supply, but if it is, there has to be full and complete accounting separation between those businesses.

The impact of the introduction of retail competition has been dramatic (see Figure 12.1). Between the year 1986 and 1999, British Gas Trading's (BGT) market share by volume shipped to the industrial and commercial sector had fallen from 100% to 17%. By 1999, there were three shippers other than BGT, who had a market share of more than 10%. Indeed, in the first quarter of 1999-2000, two shippers had a market share greater than that of BGT. This shows the extent to which competition has progressed in the retail gas industry. The British Gas monopoly has been conclusively removed - at least in the industrial and commercial sector.

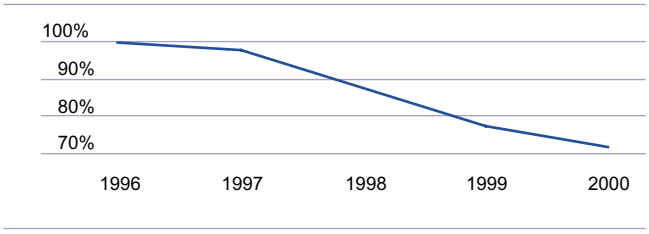
Figure 12.1: BGT share of commercial/industrial market



It is perhaps inevitable that competition should bring benefits first to the large users who have some degree of buyer-power. This is especially true in the retail gas sector, where large users had enjoyed an element of choice of supplier prior to privatisation. For competition to be successful, however, there must be benefits for all customers.

In its last review of the domestic sector[2] Ofgem stated that almost all customers were aware of alternative gas suppliers, and in 2000 an average of just fewer than 60,000 domestic customers changed supplier each week. This brought the total number of domestic customers who had switched supplier to around six million. During the year a further 2.5 million customers had signed up to dual fuel packages where the same company supplies gas and electricity. Competition appears to have developed in particular with customers who pay by direct debit, and BGT's market share has continued to fall, to around 70%. Transferring to one of BGT's 15 competitors could lead to a reduction of up to 20% for some domestic customers.

Figure 12.2: BGT share of domestic market



[1] The Department of Trade and Industry handles the allocation of licences for exploration and production on behalf of the government.

[2] *A Review of the Development of Competition in Domestic Gas and Electricity Supply*, Ofgem, December 2000.

In contrast, however, the monopoly position of Transco has remained.

The gas distribution network is similar to the water network in that it is a clear natural monopoly. However, an important difference is that the network is national and there are a number of points at which gas can be put into the network. This has facilitated competition in the upstream supply process which is in marked contrast to the water industry.

c) Development of competition in the electricity industry

The UK electricity industry has followed the gas industry through the significant changes brought about by privatisation and liberalisation. Privatisation occurred later than in the gas industry, and, unlike in the gas industry, the privatisation process was an integral part of the liberalisation of the market. The introduction of competition happened very much quicker than in gas, but with very similar effects. In many ways, there is now a retail market for energy services as opposed to two separate markets for electricity and for gas. There is no doubt that lessons were learned from the experience of liberalising the gas industry and these had an impact on how competition developed in the electricity industry. Full competition was a reality in the retail domestic electricity market by May 1999.

The current framework for the electricity industry was set out in the Electricity Act 1989 and was developed by the Utilities Act 2000. As in the gas market, Ofgem is the regulator of all aspects of the industry. The 1989 Act originally provided for three activities to be licensed in relation to electricity supply – generation, transmission and supply. At the time of privatisation, the 14 electricity area boards became 14 Public Electricity Suppliers (PESs), each licensed to supply electricity in a specified area. Scotland was treated slightly differently, since the two PESs were granted consolidated licences, which allowed them also to carry out transmission and generation activities. Scottish Power and Scottish Hydro Electric, now a subsidiary of Scottish and Southern Energy, hold these licences. In England and Wales there was only one transmission licence in existence, which is held by the National Grid Company. There were three generators of electricity: National Power, Powergen and British Energy.

There has been considerable progress in the development of competition in the market, both in generation and at retail. The wires business (the transmission and distribution networks) has remained a local or national monopoly. There are now around 50 generating companies in the electricity industry. These companies compete against one another to produce and sell electricity. The initial system was that the generators would quote a price for supply and that all suppliers would receive the same price at which demand balanced with supply. This meant that suppliers who could not easily vary their generation output would bid a very low price in order to ensure that their electricity would be sold.

Ofgem introduced the New Electricity Trading Arrangements (NETA) in March 2001. This was designed to put further downward pressure on electricity generation prices. The arrangements place a premium on predictability, since there is likely to be a very high degree of price variance for electricity generated outside long-term agreements. A recent study by Ofgem on the effects of NETA would appear to confirm its success. Wholesale electricity prices are now 20-25% lower

Table 12.2: Development of the electricity industry 1989–2000

Date	Development
1989	• Electricity Act 1989 provides framework for introduction of competition in the electricity industry.
1990	• Competition begins for industrial and commercial customers with a maximum demand over one megawatt
1994	• Competition extended to customers with maximum usage over 100 kW
1998	• Domestic competition rolled out, with customers gradually being phased in according to their postcode.
1999	• Competition extended to all customers.
2000	• Over 4 million (16.5%) electricity customers had left their home supplier. It was in the Midlands and East Midlands areas that new suppliers had most success.
2000	• Utilities Act places a primary duty on the regulator to promote the interests of consumer, gives greater regulatory powers against anti-competitive practices and enables the introduction of new wholesale electricity arrangements (NETA).

than would have been expected under the previous pool arrangement. There is also greater market liquidity, with a threefold increase in the volume of trades and a doubling of the number of contracts struck compared with last year.

After generation, the electricity is put into the National Grid (in England and Wales) at high voltage, where it is carried along pylons to the regional distribution companies. In Scotland, this is done by Scottish Power and Scottish and Southern Energy. As this is a natural monopoly activity, Ofgem sets price limits on electricity transmission. The electricity is then distributed around the designated supply regions and steadily transformed to lower voltages as it moves towards the 240 volt supply required by households. In England and Wales, this is the responsibility of the 14 PESs and in Scotland of Scottish Power and of Scottish Hydro Electric. As with transmission through the national grid, Ofgem regulates the price of electricity distribution at a national level. This too is a natural monopoly and there is little or no likelihood of in the market competition.

Until recently, the public electricity supplier handled both distribution and the retail supply to customers. Ofgem has, however, required the separation of the distribution and supply activities into separate legal entities. It is likely that this will further increase in the market competition for the retail market and will improve both service and prices available to customers. Ofgem does still set retail price limits, because of the residual monopoly effect at a local level, but this has become a true maximum and is de facto little more than a safety net. Competition has typically ensured that a lower price has been available to customers. It is expected that these price limits might be removed from 2002 onwards. As with the gas industry, it is common for supply and generation licences to be held by a single conglomerate, however as in the gas industry, the regulatory regime requires total separation of the different parts of the industry value chain.

There is some evidence that there will be a significant consolidation in the number of electricity retailers. Innogy, the holding company which owns National Power, has made a number of moves to strengthen the position of its Npower brand. In March 2000, Npower launched a wide range of price and payment options, offering one of the most comprehensive choices for residential customers in the UK.

Price options included:

- the choice whether or not to have a standing charge,
- dual fuel for three years at a capped rate,
- dual fuel direct debit discount,
- single fuel with a direct debit discount.

The company recently set up an alliance with Greenpeace to provide a product called ‘Juice’. This scheme enables 50,000 domestic electricity customers to receive their electricity from clearly identified, entirely renewable sources at the same costs as any other customer.

In addition, Innogy recently acquired the supply and distribution business of Yorkshire Electricity, and during summer 2001 announced that it would swap the distribution assets of Yorkshire Electricity for the retail supply business of Northern Electric. This increased Npower’s total number of retail customers to approximately 7 million.

Similarly, Powergen, another company with its origin in generation has looked to expand its retail customer base. It has acquired East Midland Electricity, (EME), the distribution and supply company for the East Midlands area. EME serves some 2.4 million customers. Powergen now has a total customer base of around 3.2 million.

Scottish Hydro Electric has also been keen to expand its customer base. In April 2000, it merged with Southern Energy and in 2001 acquired the assets of SWALEC from WPD. Centrica (the retail arm of British Gas) has also been active in acquiring electricity retail customers and has now reached approximately 4.4 million.

The market shares of the leading electricity supply companies in the domestic market as at December 2000 are shown in Table 12.3.

Table 12.3: National market shares[3]

Supplier	Market share by customers supplied
Npower	18%
TXU Europe	17%
Scottish and Southern	17%
Scottish Power	12%
London Electricity	11%
Centrica	10%
Powergen	8%
Seeboard Energy	7%
Others	<1%

The first five companies in the table own at least two PESs, with Scottish and Southern Energy owning three. BGT (Centrica) is the only supplier with a market share of more than 1% that does not own a PES supply business, and has attracted all of its customers through sales and marketing. Customer switching rates during 2000 averaged just under 140,000 per week. The average price reduction approached 17% compared with the incumbent PES. The PESs' shares of their regional markets vary across the country, from 67% to 94% of customers.

d) Similarities to the water industry

It has become commonplace to describe the electricity and gas sectors as competitive, but this competitive element has appeared only in those elements of the value chain where there was not a significant element of natural monopoly. Indeed, there is no sign of competition in any of the activities that are demonstrable natural monopolies. The elements of natural monopoly are, however, greater in the water sector. The likely consequence is that competition for the market will probably be a greater factor in the water industry, than in electricity and gas, where in the market competition was possible in the upstream value chain.

The local nature of the water distribution and sewage collection infrastructure is the major single difference between the water sector and the gas and electricity sectors. This introduces an extra element of natural monopoly into the water and sewage treatment activities. Unlike in electricity and gas, if water is treated at a particular location, it can be distributed only to specific, limited locations. There are also limits to the length of time treated water can be stored. This obviously limits the demand for the treated water to the area where it was produced. Since there are clear economies of scale in treatment, there are very significant barriers to entry if the incumbent is efficient.

e) Successes of utilities

i) Value for money

One of the main aims of government and regulators when introducing competition to the utilities was to increase efficiency. This greater efficiency would sustainably reduce costs and hence prices. This policy would appear to have been successful. Prices have fallen in both the gas and the electricity sectors.

Industrial gas prices fell by over 40% in real terms between 1992 and 1996, and in 1999 prices were some 45% lower than in 1990. There have also been benefits to domestic customers. Since competition was introduced to the domestic market (during 1997 and 1998), new gas suppliers offer savings of around £50 on an average gas bill of £315.

In the electricity market, there has been a similar pattern. Industrial prices in 1999 were 22% lower in real terms than in 1994. They were 26% down on 1990. Domestic prices were also lower by 1999. New suppliers typically offer savings of between £10 and £40 on an average £270 bill.

This has been possible because the introduction of competition has forced the energy industry to become more efficient. Table 12.4 sets out the range of tariffs that are available to customers in the Eastern area.

A direct debit customer who has used the internet arm of Amerada can expect to pay £195 per year. The same customer who remains with the incumbent would pay £226. Savings of up to 15% are therefore available.

ii) Improvements in customer service

One of the recurring themes of this Review is that a fall in costs is only an efficiency if standards are, at worst, maintained. The experience of other utilities would suggest that it is possible to improve standards at the same time as reducing costs. The regulator has consistently raised the expected standard of service

[3] Source: *"A Review of the Development of Competition in Domestic Gas and Electricity Supply"*, Ofgem, December 2000. The figures have been adjusted to take account of Npower's acquisition of the supply businesses of Yorkshire Electricity and Northern Electricity.

Table 12.4: Eastern area – annual bill (standard rate electricity)

Medium user	Amerada	Atlantoc	Basic Power	British Gas	Eastern Energy	London Elec-tricity /Sweb	Northern Electric & Gas	Npower	Powergen	Scottish Power	Seeboard Energy	Southern Electric	Amerada. co.uk
Direct debit	£198	£198	£211	£209	£226	£202	£202	£202	£212	£203	£207	£201	£195
Standard Credit	£213	£208	£224	£220	£232	£213	£212	£208	£222	£223	£215	£212	£222
Pre-payment	£302	£243	£236	£230	£243	£290	£262	£260	£238	£243	£242	£244	-

that was required of energy companies. Competition seems to have had a positive impact on the level of customer service.

Ofgem data shows that the number of failures to meet guaranteed standards per 100,000 electricity customers has fallen consistently, from over 50 in 1991-92 to under 10 in 1998-99[4]. The number of electricity interruptions per customer has fallen by 30% since 1990 and, more importantly, the number of minutes customers are left without supply has fallen to around a third of the 1990 level. Customer service has also improved markedly. In 1996, British Gas responded to 76% of letters within five days – by 1999 this was 100%.

iii) Delivery of environmental improvements

It is imperative that opening up competitive markets or achieving cost savings should not jeopardise compliance with the relevant environmental standards. Doing so would again not qualify as an efficiency under my definition. The electricity industry appears to be contributing to reductions in carbon dioxide emissions that are required. Between 1990 and 1999, total emissions were down 7.5%, despite an increase in energy consumption of some 5.5%. CO_2 emissions from power stations fell by 28.5% over the same period. Around half of that decrease was attributed to greater efficiency in electricity generation, and half to the use of less carbon intensive fuels such as gas and nuclear instead of oil and coal. Competition and pressure for efficiency does not seem to have had any negative impact on environmental performance.

iv) Improvements in levels of service in the water sector

Since 1991, water industry performance in England and Wales has shown a steady improvement across a range of levels of service indicators. These improvements reflect the continuing efforts of companies to improve service to customers, and in particular to reduce problems of low pressure and the risk of sewer flooding. Table 12.5 below highlights the improvements made in key areas over the past decade.

In order to put this into full perspective, it is important to note that the companies have become some 50% more efficient in terms of operations and capital expenditure during the same period (see Chapters 18 and 19).

f) Failures of liberalised market

i) Mis-selling of bundled services

Liberalisation of the retail energy market led to a determined effort by a number of companies to increase their market share. The tactics of some commission-based sales people quickly became a matter of concern.

In response to complaints about doorstep sales practices, a marketing condition was added to gas and electricity suppliers' licences in January 1998. The condition lays down rules about the way in which companies sell and follow up contracts signed on the doorstep. It also covers telephone selling. There are requirements for suppliers to ensure that agents are managed properly to prevent mis-selling by their staff or agents on the doorstep. These rules require sales agents to make it clear to a customer that he or she has entered into a contract. The rules also require gas companies to provide a written copy of the terms and conditions of their contract within two days to customers who respond to telephone sales.

This measure appears to have been effective since less than 8 people per 10,000 transfers have complained.

ii) Independent Energy

Independent Energy was one of the new retailers who entered the electricity and gas retail markets in September 1998.

Independent Energy very quickly acquired a large customer base, both in the electricity and gas markets. It adopted aggressive marketing techniques, including door step selling, and held roadshows to encourage customers to switch. Within two years, Independent Energy had 240,000 domestic and

[4] Quoted in DTI, *The Social Effects of Liberalisation: the UK Experience*, Lisbon 5/6 June 2000.

Table 12.5: Levels of service for the water industry in England & Wales in 2000-01[5]

Description	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01
Properties at risk of low pressure	1.85%	1.69%	1.26%	1.02%	0.80%	0.78%	0.43%	0.25%	0.16%	0.13%	0.11%
Properties subject to unplanned supply interruptions of 12 hours or more	0.42%	0.2%	0.38%	0.35%	0.26%	0.58%	0.21%	0.15%	0.05%	0.06%	0.11%
Written complaints not responded to (within 10 working days)	31.09%	25.64%	18.14%	24.12%	5.48%	5.79%	5.07%	1.99%	1.28%	0.64%	0.44%
Properties subject to hosepipe bans	41%	13%	12%	0%	3%	39%	30%	3%	3%	0%	0%
Company estimates of total leakage (Ml/d)	-	-	-	-	5,112	4,980	4,528	3,989	3,551	3,306	-

commercial electricity customers and 80,000 gas households. The company admitted in May 2000 that it faced significant problems setting up accounts and billing many of its customers. Detailed discussions were held with Ofgem to try to resolve the problem.

The situation for Independent Energy worsened when problems with its call centre meant that customers could not contact the company to discuss their problems. This resulted in a significant increase in complaints to Ofgem.

An agreement was reached between Ofgem and Independent Energy on a new licence condition, which set out requirements for performance in customer service. The new licence condition required the company to:

- transfer customers properly;
- process customer cancellations effectively;
- issue accurate and timely bills;
- improve the ways that customers could contact the company; and
- deal properly with queries and complaints.

Independent Energy also agreed not to take on any new domestic or small business electricity customers, and to stop its marketing activities.

The billing and cash collection problems did not improve and on 8 September 2000, Independent Energy called in the receivers.

The company stated that it had "explored the available avenues to find a solution to its billing and cash collection problems but was unable to find a solution which was acceptable to its lending banks".

Independent Energy was ultimately bought by Innogy for £10 million.

This example clearly shows the risks involved in the retail of utility services and the ease with which "apparent success" can become failure.

[5] Ofwat, *Levels of service for the water industry in England and Wales 2000-2001 report* July 2001.

iii) Electricity/water mergers

There have been three high profile mergers between water and electricity companies. The rationale for each of these mergers - synergies in the customer base - has now proven to be more illusory than actual. Scottish Power's acquisition of Southern Water and North West Water's acquisition of Norweb, whilst bringing some benefits to customers in terms of efficiency, have not produced either the return expected by shareholders or the expected improvements to customer service. The merger of Welsh Water (Dŵr Cymru) and SWALEC is discussed below.

g) Hyder: A case study

Welsh Water (Dŵr Cymru) made a number of acquisitions outside its core water business in the early years after privatisation. These acquisitions ranged from hotels to a healthcare procurement company. Considerable management attention was also devoted to the development of other activities, including a consulting business. This diversification was funded by the core water business. As a result of the diversification insufficient management time appears to have been focussed on the core business.

The diversifications of Welsh Water (Dŵr Cymru) and the funding of the large investment programme resulted in a worsening debt profile. However, this became a more immediate problem with the acquisition for cash of SWALEC in 1996. The rationale behind the merger was that the creation of a multi-utility by merging the Welsh electricity and water companies would provide significant operational and customer synergies. This strategy was undone by the tough regulatory review of the electricity sector in 1998, which meant that the level of debt became a major drain on resources.

The 1999 water price review made Hyder's position untenable. This review judged Welsh Water (Dŵr Cymru) to be the least efficient water company in England and Wales. Welsh Water (Dwr Cymru) disputed this ranking but did not appeal to the Competition Commission.

During the first half of 2000, Nomura, the Japanese Investment Bank, made an offer for Hyder plc. The situation became highly competitive and quite bitter when an American electricity company, Western Power and Distribution (WPD) entered into the picture. The battle was finally won by WPD after sealed bids (for the first time ever) had been required by the Take-Over Panel.

WPD had no interest in retaining the water business and had agreed initially to sub-contract the operations to United Utilities (the parent company of North West Water). This plan was challenged in court by Severn Trent plc on the grounds that this arrangement was in breach of the European Procurement Directive. Severn Trent won the case and this led to the original agreement being nullified.

Two executives from Welsh Water (Dŵr Cymru) had been charged by the Board of Hyder to find an alternative to the Nomura bid. Their answer was to establish Glas Cymru, as a not-for-profit company limited by guarantee, in March 2000. This company was established with the sole purpose of acquiring and owning Welsh Water (Dŵr Cymru). This transaction was finally completed in May 2001, when Glas Cymru bought Welsh Water (Dŵr Cymru) from WPD for £1.85 billion, 95% of its regulatory asset value.

Glas Cymru is owned and controlled by members who do not receive dividends or have any other financial interest in the company. It has no shareholders and is almost entirely financed by debt in the form of long maturity, strong investment grade bonds.

The transaction required regulatory approval. This was not easy since the proposal for the company to be 100% debt financed was generally regarded as radical. There were (and in some quarters are) significant concerns about the long-term performance of a company that does not have to account to its shareholders for its performance. Before Ofwat consented to Glas' proposals they consulted widely and developed six conditions which Glas had to satisfy in order to gain regulatory approval. These were that Glas:

- agreed to the licence modifications proposed by Ofwat;
- gave a public commitment to reductions in charges for customers;
- made public its incentive scheme for executive management;
- provided a public statement on its commitment to limiting its activities to the single purpose of providing water and sewerage services;

- gave a public commitment to appoint the members of Glas Cymru on the basis of best practice;
- confirmed that the rights proposed for bondholders would not impede the Director's duties under the Water Industry Act 1991.

Fears that it may be difficult to raise the finance for the transaction proved to be unfounded. The following series of measures were proposed, which reassured the debt markets that risk was minimised.

- Diversification outside of the water and sewerage business in Wales was precluded.
- Reserves would be built up to £350 million to protect creditors against any operational shocks.
- Operational and customer service activities were sub-contracted to United Utilities and to Thames Water.
- Special step in rights were created for bondholders if covenants were breached.
- Credit insurance through MBIA[6] was arranged, which allowed a significant proportion of the bond issue to receive the highest possible Triple A rating.

The bond issue was placed with 79 investors in the UK and abroad. Just over £1.9 billion of asset backed bonds were issued to finance the purchase of Welsh Water (Dŵr Cymru). The issue was 70% over-subscribed.

One of the stated aims of the management of Glas Cymru is to try to reduce regulatory risk. It has removed the potential tension between regulator, customer and shareholder, by pledging that bills will be cut, with any surplus over and above that required to maintain the company's credit rating. It has introduced greater transparency - for example, its June Return was published on its Web Site at the same time as it was submitted to Ofwat, and the company's management incentives have been published.

There does seem to be a real likelihood that customers will benefit from the new structure. Glas Cymru owns the assets of Welsh Water (Dŵr Cymru), but whilst it has retained the strategic asset management function, it has sub-contracted all other activities. This has increased the proportion of work that is contracted out from 60% before the take over, to 85%.

Welsh Water (Dŵr Cymru) has entered into a four-year contract with United Utilities and Thames Water to manage its day-to-day operation and to bill customers. This significantly reduces operational risks for Welsh Water (Dŵr Cymru), indeed in price terms also it seems that Glas has benefited significantly.

These operating contracts will ensure that Welsh Water (Dŵr Cymru) comfortably beats the efficiency targets set for the current regulatory period by Ofwat. This performance and the reduction in the cost of capital achieved by Glas Cymru's 100% debt-funded structure will allow customers' bills to be cut by £10 per household before the end of this regulatory period. The cost of capital for Glas Cymru is about 4.1% net of tax, compared with the 4.75% net allowed by Ofwat for this period.

It is, of course, impossible to eliminate all risk. All structures are, in the end, vulnerable to shocks. The equity-funded model can be vulnerable to shocks if it is managed poorly, and customers would ultimately lose out. The current high credit ratings depend on Glas Cymru increasing its reserves from the current £150 million to £350 million by 2005. This should protect creditors from even quite a major shock: the 1995 drought, for example, cost Yorkshire Water Ltd. £49.3 million. This confirms that Glas Cymru has adopted a fairly prudent approach to its finances. The restrictions on the activity of Glas Cymru and the focus on reducing costs should ensure that the company is as well-placed as the equity-based companies to survive any shock.

The clear incentive structure that Glas Cymru has in place is another important factor. It aims to ensure that management is rewarded for success, i.e. generating the surplus that will allow customers' bills to be cut. These bonuses can be up to 80% of basic salary and have been subjected to full and proper scrutiny. They will only be earned if the performance of Welsh Water (Dŵr Cymru) does allow the customer rebate to be effected.

i) Key success factors

In my view there are three key success factors that will see Welsh customers benefit from this new structure.

[6] MBIA Insurance Corporation, formerly known as Municipal Bond Investors Assurance Corporation, has guaranteed that the interest due on certain tranches of the bonds will be paid. These tranches have therefore acquired the highest possible rating.

Focus on costs

Glas Cymru has been quite innovative in addressing all of its costs. In the English and Welsh context, it is not surprising that the principal focus of commentators has been on the reduction in the costs of capital. This is because this funding cost does represent a challenge to existing, equity-based financing structures. However, just as impressive from a Scottish viewpoint is that the operational costs will be reduced considerably during this regulatory review period. Glas is also among the leaders in pioneering a partnership approach to the delivery of its capital programme. Early reports suggest that the programme will be delivered ahead of budget.

Focus on core activities

Glas Cymru's constitution limits its operations to the core activities of providing a water and waste water service within the Welsh Water (Dŵr Cymru) area. The company will be responsible for environmental and public health compliance and will take all the decisions about capital investment. Welsh Water (Dŵr Cymru) has retained its strategic asset management function, as this is the core of the water business.

Incentive to management

It is important from a customer's perspective that the promises on bills that have been made during the establishment of Glas are realised in practice. The alignment of management bonuses with the promised reductions in bills is a very positive step.

I believe that all three of these factors are important and appropriate lessons should be learned for Scotland. However I discuss the issue of incentives in Chapter 26 and the issues surrounding diversification in Chapter 27. The greater part of this Review is dedicated to the proposition that the customer interest is best served by increasing the efficiency of the water industry.

h) Overview of the key success factors and conclusion

There are five principal lessons that I believe should be learned from developments in the utilities sector in the last decade. These are the importance of:

- understanding the businesses of utilities,
- focusing on key competences,
- focus on cost reduction,
- effective governance,
- regulatory scrutiny.

i) Understanding the businesses of utilities

The development of competition in the electricity and the gas industries has brought significant benefits to customers. The truly competitive elements are, however, quite limited at the production and retail ends of the value chain. The key to encouraging competition has been to separate the natural monopoly element of the value chain from those areas where the barrier to competition was the dominance of the incumbent and the manner in which a process had been done (e.g. meter reading).

The principal difference between the electricity and gas sectors and the water sector is the absence of a national grid. This will mean that competition in the production of potable water or the treatment of sewage will only be possible at a relatively local level. In many cases, if not most, abstraction and treatment is likely to retain significant aspects of natural monopoly.

Competition in retail activities and the potential for 'for the market' competition will play an important role in driving inefficiency out of any business process. This has been clearly demonstrated by the improvements in customer service and the lower costs from which other utilities' customers have benefited. Welsh Water (Dŵr Cymru) is a clear example of the potential benefits of for the market competition. Regulation of the natural monopoly activity is, however, equally important, as this ensures that the activity becomes more efficient. All customers benefit from genuine efficiency.

ii) Focusing on key competences

The less successful companies in the water, electricity and gas sectors in England and Wales have lost sight of their core competences, that is the activities which they do well. This loss of focus has taken two directions: firstly, diversification outside the core business and secondly, a failure to recognise that some activities may be better out-sourced than done in-house. The risks of diversification are quite clear from the Welsh Water (Dŵr Cymru) case study. The rapid progress that will be made

by Welsh Water (Dŵr Cymru) in the new Glas structure towards the efficiency frontier is clear evidence of how out-sourcing can bring benefits, by allowing management to focus on the key activities that are critical to ensuring a sustainable future for the organisation.

iii) Focusing on cost reduction

The challenge for management is to ensure that there is a proper balance between the need to cut costs in the core natural monopoly business (and the benefits, which will accrue to customers) and focused effort on revenue retention in the competitive areas of the value chain. In the water sector, losing 10% of retail business increases unit costs by about 1.0%. For the Scottish authorities, which are a long way from the efficiency frontier, there are easier ways to improve customer value by 1.0%.

It is likely that the most leveraged activity from a customer standpoint is to ensure that the organisation is as efficient as possible. A proper focus on costs will ensure that tariffs can be made more reflective of the actual incidence of costs. As such, the threat to revenue even in the competitive area of the business is likely to be significantly reduced.

I discuss the importance of accounting separation in Chapter 14. This separation of activities is an important mechanism to ensure that costs for customers are minimised.

iv) Effective governance

The role of the Board is to ensure that the organisation and its management stick to a clear and sensible strategy. Effective corporate governance is rarely noticed, but failures become apparent very quickly, often with negative implications for customers and shareholders. Effective corporate governance will result if the Board sets a clear strategy, which includes close attention to costs and keeps sight of the principal reason why the organisation exists.

v) Regulatory scrutiny

Regulatory scrutiny will help to ensure that costs are minimised. In part this will result from separating out the competitive activities and ensuring that the necessary transparency is created in order to facilitate competition. The most critical role of regulation is, however, to ensure that the natural monopoly is made efficient.

The other important area is the transparent assessment of performance. The Ofwat service and efficiency league tables and the Ofgem and Oftel websites, which allow bills to be compared are good examples of this. This public comparison must be taken seriously by management, by Boards and by shareholders. There would seem to be a significant benefit in comparing the performance of the Scottish water industry with its peers in England and Wales.

In Scotland, we are able to learn from the water industry south of the Border or from other utilities. It is clear that these industries have benefited by embracing competition in those areas where it ought to exist, and by focusing on cost reduction in the natural monopoly element of the value chain. There are dangers in losing sight of the most important issue - the delivery of a good service at an acceptable price. This requires a focus on cost reduction. Non-core activities may well prove to be more of a distraction than a benefit and should be very carefully assessed. This is an issue to which I return in Chapter 27.

Section 3: Chapter 13
Competition: Scottish Water Industry Revenues

a) Introduction

In Chapter 11, I analysed the likelihood of competition in the Scottish water industry. I concluded that if the Scottish water industry were efficient, competition would have only a marginal impact on revenues. This crucially depends on structuring tariffs that broadly reflect costs.

In this chapter I analyse the current tariff structure and revenue breakdown of the authorities. I then assess the likely impact of harmonisation of charges in Scotland on various typical customers. I close the chapter with a review of the potential impact of 'retail' competition on the industry and the advantages it would bring from a customer standpoint.

Over 96% of Scottish consumers are connected to the water and 92% to the sewerage systems operated by Scotland's three public water authorities. Customers have become much more aware of their water charges because of recent increases.

There have been three factors that have had an adverse impact on the levels of charges over the last five years. These were:

- direct charging for waste water,
- harmonisation of charges,
- increased investment.

Charges are now harmonised for domestic customers in each of the three water authority areas. Waste water charges are paid by all domestic customers who are connected to the public sewerage system. Under investment in the past 20 or 30 years means that investment must again increase during this regulatory period if the system is to be properly maintained and environmental and public health compliance ensured. This will unfortunately lead to a further increase in average charge levels in Scotland.

It is important to understand what the impact of harmonisation of charges across Scotland will be if the proposed Scottish Water is approved. Customers need to understand the timing and extent of any increase in charges. This allows them to manage the impact of any increases on their budgets.

b) Funding of the Scottish water industry

The Scottish water industry has 2.26 million domestic customers and over 180,000 non-domestic customers. Tables 13.1-13.4 below show the increases in revenue paid by customers since the water authorities were established. Water charges have increased by 38.5% and sewerage charges have increased by 142.7%. Of the increase in sewerage charges, 91.5% resulted from the policy decision to charge directly for sewerage services.

Borrowing, which counts as public expenditure, also increased markedly during the period. The increase in borrowing over the first five years of the authorities' existence was over £930 million. This increase in borrowing has delayed the impact on charges of the increase in the investment programme. However the industry

Table 13.1: Funding of East of Scotland Water Authority

East	1996–97	1997–98	1998–99	1999–00	2000–01	% Change 1996–2001
Water	£93.5m	£101.2m	£111.8m	£117.0m	£133.4m	42.7%
	n/a	8.2%	10.5%	4.7%	12.6%	
Waste water	£40.0m	£52.8m	£72.2m	£89.0m	£98.9m	147.2%
	n/a	32.0%	36.7%	23.3%	11.1%	
Transitional relief	£27.3m	£18.2m	£9.1m	(100%)	£0m	(100%)
	n/a	(33.3%)	(50%)	£0m	n/a	
Other	£0.7m	£0.91m	£0.91m	£0.88m	£0m	(100%)
	n/a	30.5%	0.1%	(3.4%)	(100%)	
New debt	£64.0m	£56.4m	£50.4m	£78.5m	£73.4m	14.7%
	n/a	(11.9%)	(10.6%)	55.8%	(6.5%)	
Capital grants	£5.9m	£0m	£0.5m	£2.0m	£0.83m	(85.9%)
	n/a	(100%)	n/a	400%	(58.5%)	
Total	**£231.4m**	**£229.5m**	**£244.9m**	**£287.4m**	**£306.5m**	**32.5%**
	n/a	**(0.8%)**	**6.7%**	**17.3%**	**6.7%**	

cannot afford to keep borrowing at the same rate and, as a result, the increase in investment in this regulatory period will have a more direct impact on customers' bills. The efficiency targets that I have set will mitigate the need for an increase in charges – it will not, however, eliminate it.

Table 13.2: Funding of North of Scotland Water Authority

North	1996–97	1997–98	1998–99	1999–00	2000–01	% Change 1996–2001
Water	£64.8m	£68.5m	£74.5m	£80.1m	£107.83m	66.4%
	n/a	5.7%	8.8%	7.5%	34.6%	
Waste water	£32.9m	£44.5m	£55.9m	£72.4m	£99.4m	202.1%
	n/a	35.3%	25.6%	29.5%	37.3%	
Transitional relief	£22.4m	£14.9m	£7.4m	£0m	£0m	(100%)
	n/a	(33.5%)	(50.3%)	(100%)	n/a	
Other	£0.2m	£0m	£0m	£1.4m	£0m	(100%)
	n/a	(100%)	n/a	(100%)	(100%)	
New Debt	£41.6m	£47.9m	£43.7m	£39.7m	£50.0m	20.2%
	n/a	13.2%	(7.2%)	(9.2%)	25.9%	
Capital Grants	£24.3m	£1.6m	£2.7m	£3.9m	£2m	(91.8%)
	n/a	(93.4%)	67.4%	45.6%	(48.7%)	
Total	**£186.2m**	**£177.4m**	**£184.2m**	**£197.5m**	**£259.2m**	**39.2%**
	n/a	**(4.7%)**	**3.8%**	**7.2%**	**31.2%**	

Table 13.3: Funding of West of Scotland Water Authority

West	1996–97	1997–98	1998–99	1999–00	2000–01	% Change 1996–2001
Water	£125.5m	£131.5m	£135.2m	£140.6m	£151.9m	21.0%
	n/a	4.8%	2.8%	4.0%	8.0%	
Waste water	£75.7m	£89.3m	£117.2m	£138.1m	£162.43m	114.6%
	n/a	18.0%	31.2%	17.8%	17.6%	
Transitional relief	£40.8m	£26.6m	£13.3m	£0m	£0m	(100%)
	n/a	(34.8%)	(50%)	(100%)	n/a	
Other	£1.0m	£0m	£0m	£0m	£0m	(100%)
	n/a	(100%)	n/a	n/a	n/a	£0m
Borrowings	£76.5m	£62.4m	£71.3m	£94.4m	£85.4m	11.6%
	n/a	(18.4%)	14.3%	32.4%	(9.5%)	
Capital grants	£7.4m	£0m	£0m	£0m	£0m	(100%)
	n/a	(100%)	n/a	n/a	n/a	
Total	**£326.9m**	**£309.8m**	**£336.9m**	**£373.1m**	**£399.7m**	**22.3%**
	n/a	**(5.2%)**	**8.7%**	**10.7%**	**7.1%**	

Table 13.4: Funding of Scottish water industry

Scotland	1996–97	1997–98	1998–99	1999–00	2000–01	% Change 1996–2001
Water	£283.8m	£301.2m	£321.5m	£337.7m	£393.2	38.5%
	n/a	6.1%	6.7%	5.0%	16.4%	
Waste water	£148.6m	£186.6m	£245.3m	£299.5m	£360.7m	142.7%
	n/a	25.6%	31.5%	22.1%	20.4%	
Transitional relief	£90.5m	£59.7m	£29.7m	£0m	£0m	(100%)
	n/a	(34%)	(50%)	(100%)	n/a	
Other	£1.9m	£0.91m	£0.91m	£2.3m	£0m	(100%)
	n/a	(52.2%)	0.1%	150.8%	(100%)	
Borrowings	£182.1m	£166.7m	£165.4m	£212.6m	£208.8m	14.7%
	n/a	(8.5%)	(0.8%)	28.5%	(1.8%)	
Capital grants	£37.6m	£1.6m	£3.2m	£5.9m	£2.8m	(92.5%)
	n/a	(95.7%)	98.7%	85.6%	(52%)	
Total	**£744.5m**	**£716.7m**	**£765.9m**	**£857.9m**	**£965.5m**	**29.7%**
	n/a	**(3.7%)**	**6.9%**	**12.0%**	**12.5%**	

(NB Figures may not add exactly to totals due to rounding)

Customer charges are published in the water authorities' Schemes of Charges. These Schemes are produced annually and must be approved by me. The proposed tariffs and assumptions in the chargeable base have to be consistent with the revenue cap. If I cannot reach agreement with the authority, it is up to Scottish Ministers to make a determination.

Customers fall broadly into two main categories – domestic and non-domestic. Primary services include the provision of drinking water and sewage treatment and disposal. Secondary services include emptying septic tanks and supplying field troughs for agricultural use. All customer charges include the cost of billing, meter reading (where appropriate), and dealing with customer enquiries. Table 13.5 below divides overall revenue into primary domestic, non-domestic and secondary income (including trade effluent, but excluding inter-authority trading).

c) Domestic customers

There are very few domestic metered customers. The amount paid for water and sewerage services is based on the Council Tax band of the property. Most customers are billed for water and Council Tax by their local authority. Local authorities are paid by the water authorities for this billing and collection service.

The total required revenue for the water authority from the domestic sector is divided by the total Band D equivalent households in their area. Three Band A households equal two Band D households. One Band H household equals two Band D households. This allows a Band D charge to be fixed and the other charges are calculated on a pro-rata basis. Some customers may be eligible for a reduction in their water and sewerage bill. For example, a 25% discount is available where only one person occupies the property or a discount of 50% is available where the property is not the customer's main residence. The cost of these allowances has to be subtracted from the revenue projected by multiplying the number of Band D equivalent households by the appropriate tariff.

Table 13.5: 2000-01 breakdown of revenue

Revenue	East		North		West		Total	
Domestic	£128.65m	59%	£113.96m	57%	£176.40m	58%	£419.01m	58%
Non-domestic	£89.06m	41%	£86.33m	43%	£129.14m	42%	£304.53m	42%
Primary Total	£217.71m	100%	£200.29m	100%	£305.54m	100%	£723.54m	100%
Other	£7.13m		£6.93m		£8.72m		£22.78m	
Total	**£224.84m**		**£207.22m**		**£314.26m**		**£746.32m**	

Table 13.6: Calculation of water and sewerage bills 2001–02

	Council Tax Band A	Council Tax Band B	Council Tax Band C	Council Tax Band D	Council Tax Band E	Council Tax Band F	Council Tax Band G	Council Tax Band H
	6/9ths of Band D	7/9ths of Band D	8/9ths of Band D	9/9ths of Band D	11/9ths of Band D	13/9ths of Band D	15/9ths of Band D	18/9ths of Band D
East	£180.00	£210.00	£240.00	£270.00	£330.00	£390.00	£450.00	£540.0
North	£233.45	£272.36	£311.27	£350.18	£428.00	£505.81	£583.63	£700.36
West	£177.60	£207.20	£236.80	£266.40	£325.60	£384.80	£444.00	£532.80

d) Non-domestic customers

Most non-domestic customers are charged according to the volume of water they receive. Non-domestic customers also pay a fixed charge. These fixed charges vary according to the size of the meter. The volume of water consumed is metered, or in some cases where a meter is not yet installed, charges calculations are based on an estimated volume that is linked to the property's rateable value. East of Scotland Water Authority bases charges on the diameter of the supply pipe.

Waste water charges for metered customers are based on the assumption that the volume of waste returning to sewer is 95% of the clean water entering the premises. This may vary if the customer can demonstrate that a lower volume of waste returns to the sewerage system. A bowling green that uses an irrigation system is an example of a relatively large user of water who might return a relatively lower proportion to sewer.

For East and West of Scotland Water Authorities, non-domestic customer charges also include a surface water drainage charge that relates to the surface area of the property that drains to the public network.

Table 13.7: East of Scotland Water Authority non-domestic water charges

Meter size	Annual charge	Meter size	Annual charge
6 mm	£6	75 mm	£4,300
8 mm	£12	100 mm	£9,100
10 mm	£21	150 mm	£26,500
13 mm	£43	200 mm	£56,400
18 mm	£100	250 mm	£101,500
25 mm	£240	300 mm	£164,000
30 mm	£385	400 mm	£349,300
37 mm	£670	450 mm	£476,000
50 mm	£1,475	600 mm	£1,015,000
63 mm	£2,700		

The water authorities bill non-domestic customers directly. Tables 13.7-13.17 below show the tariffs for non-domestic customers in 2001-02.

Table 13.8: East of Scotland Water Authority volumetric water charges

Tariff Type	Price
Tariff up to 100,000 m3 per year	£0.61 per m3 of water supplied
Tariff from 100,000 m3 to 250,000 m3 per year	£0.549 per m3 of water supplied
Tariff over 250,000 m3 per year	£0.5185 per m3 of water supplied

Table 13.9: East of Scotland Water Authority non-domestic waste water charges

Calculated pipe size	Annual charge	Calculated pipe size mm	Annual charge
6mm	£10	50 mm	£2,760
8mm	£22	63 mm	£5,060
10mm	£40	75 mm	£8,000
13mm	£80	100 mm	£17,100
18mm	£190	150 mm	£49,600
25mm	£450	200 mm	£105,600
30mm	£720	250 mm	£190,000
37mm	£1,250		

Table 13.10: East of Scotland Water Authority volumetric waste water charges

Volume charge	£0.96 m3.
Surface water drainage charge	0.7p per £ of gross rateable value (GRV)

Table 13.11: North of Scotland Water Authority non-domestic water charges

Meter size	Annual standing charge
Up to 25 mm	£74
40 mm	£88
50 mm	£101
80–100 mm	£137
150 mm or over	£205

Table 13.12: North of Scotland Water Authority volumetric water charges

Tariff Type	Price
Tariff up to 100,000 m3 per year	£1.0410 per m3 of water supplied
Tariff from 100,000 m3 to 250,000 m3 per year	£0.8849 per m3 of water supplied
Tariff over 250,000 m3 per year	£0.7287 per m3 of water supplied
Unmeasured non-household water supply charges	Tayside 8.6p per £ of rateable value All other areas 9.76p per £ of rateable value

Table 13.13: North of Scotland Water Authority non-domestic waste water charges

Volumetric charges	
Volume charge	£0.3079 m3
Surface water drainage charge	£0.0793 per £ of rateable value
Unmeasured non-household waste water service charges	9.61p per £ of rateable value

Table 13.14: West of Scotland Water Authority non-domestic water charges

Meter size	Network charge	Customer service charge	Combined annual charge
Up to 20 mm	£57	£43	£100
25 mm	£228	£119	£347
40 mm	£513	£247	£760
50 mm	£913	£426	£1,339
80 mm	£2,054	£936	£2,990
100 mm	£3,651	£1,651	£5,302
150 mm	£8,215	£3,694	£11,909
200 mm	£14,604	£6,554	£21,158
250 mm	£18,495	£8,291	£26,786
300 mm	£32,859	£14,726	£47,585

Table 13.15: West of Scotland Water Authority volumetric water charges

Tariff Type	Price
Tariff up to 100,000 m3 per year	£0.5403 per m3 of water supplied
Tariff from 100,000 m3 to 250,000 m3 per year	£0.4863 per m3 of water supplied
Tariff over 250,000 m3 per year	£0.4593 per m3 of water supplied
Unmeasured non-household water supply charges	5.08p per £ of water rateable value

e) Segmentation of non-domestic customers

The 180,000 non-domestic customers across Scotland can be segmented further into small, medium and large customers according to water used and the level of charges paid to the water and sewerage authority. Non-domestic customers range from small businesses such as newsagents to very large users such as petrochemical manufacturers and food processors. The largest users depend upon huge amounts of water for production purposes. I have defined large users[1] as those whose consumption is greater than 100,000 m^3 per year or £100,000 per year in total water and waste water charges. This could include single or multi-site customers in both the public and private sector.

In March 2001, there were 344 large users across Scotland, 107 in the North, 84 in the East, and 153 in the West. It is worth noting that the number of large users in the North results partly from the relatively high level of charges for North of Scotland Water Authority compared with the other two authorities.

[1] The industry standard definition in the UK of a large user has been a user of over 100,000 m^3 of water on a single site. Analysis showed that in Scotland there was a need to expand the definition because of the importance of multi-site customers.

Table 13.16: West of Scotland Water Authority non-domestic waste water charges

Meter size	Network charge	Meter size	Network charge
Up to 20 mm	£20	100 mm	£1,280
25 mm	£80	150 mm	£2,880
40 mm	£180	200 mm	£5,120
50 mm	£320	250 mm	£6,480
80 mm	£720	300 mm	£11,520

Table 13.17: West of Scotland Water Authority volumetric waste water charges

Volume charge	£0.5395 per m^3 of wastewater returned
Rateable value charge	3.86 p per £ of rateable value (rainwater disposal services paid on unmeasured basis), or 3.37 p per £ of rateable value (rainwater disposal service paid on measured basis)
Measured property rainwater charge	£100 per 10 m^2 of drained area
Unmeasured non-household waste water service charges	7.05p per £ of rateable value

Table 13:18 illustrates the relative importance of large users in each of the three water authorities.

The authorities have recently begun to offer a discount to the largest single-site users of water. This discount is common practice across the UK. Companies or organisations that use over 100,000m_3 of water on a single site each year qualify for this discount.

Table 13.19 illustrates the importance of these large users in each authority area.

The East of Scotland Water Authority (and to a lesser extent the West of Scotland Water Authority) depends on a limited number of industrial sectors for its non-domestic income. Tables 13.20-13.22 below show the relative importance of sectors to the single site large user income, large user income in general and non-domestic income.

Table 13.18: Split of non-domestic customer revenue – large users and small/medium users

Primary revenue in 2000–01	East	%	North	%	West	%	Total	%
Large users	£48.5m	54%	£35.8m	41%	£59.4m	46%	**£143.7m**	**47%**
Small – medium users	£40.6m	46%	£50.5m	59%	£69.7m	54%	**£160.8m**	**53%**
Non-domestic total	**£89.1m**	**100%**	**£86.3m**	**100%**	**£129.1m**	**100%**	**£304.5m**	**100%**

Table 13.19: Split of non-domestic customer revenue – single sites, other large users, small/medium users

Primary revenue in 2000–01	East	%	North	%	West	%	Total	%
Single site large users	£17.8m	20%	£5.4m	15%	£15.2m	14%	**£38.4m**	**13%**
Other large users	£30.7m	34%	£30.4m	26%	£44.2m	32%	**£105.3m**	**35%**
Small – medium users	£40.6m	46%	£50.5m	59%	£69.7m	54%	**£160.8m**	**53%**
Non-domestic total	**£89.1m**	**100%**	**£86.3m**	**100%**	**£129.1m**	**100%**	**£304.5m**	**100%**

Table 13.20: Revenue from single-site large users

Single-site large user	East		North		West	
	Revenue	%	Revenue	%	Revenue	%
Retail	£0.0m	0%	£0.0m	0%	£0.0m	0%
Public Sector	£0.2m	1%	£0.0m	0%	£0.0m	0%
Commercial	£0.0m	0%	£0.5m	9%	£0.0m	0%
Manufacturing	£0.8m	4%	£0.3m	6%	£2.8m	18%
Services	£0.0m	0%	£0.2m	4%	£0.0m	0%
Petrochemicals	£11.8m	66%	£1.4m	26%	£4.5m	29%
Food Manufacture	£0.0m	0%	£1.5m	28%	£1.4m	9%
Utilities	£0.2m	1%	£0.9m	17%	£0.0m	0%
Drinks/Breweries	£1.1m	6%	£0.3m	6%	£2.2m	14%
Hi-Tech Manufacture	£2.5m	14%	£0.0m	0%	£2.2m	14%
Voluntary Sector	£0.0m	0%	£0.0m	0%	£0.0m	0%
Pharmaceuticals	£1.2m	7%	£0.2m	4%	£1.8m	12%
Textiles Manufacture	£0.0m	0%	£0.1m	2%	£0.3m	2%
Agricultural	£0.0m	0%	£0.0m	0%	£0.0m	0%
Totals (rounded)	**£17.8m**	**100%**	**£5.4m**	**100%**	**£15.2m**	**100%**

A significant percentage of East's total revenue from large users comes from single-site users (37%). This is largely attributable to the petrochemical sector. Petrochemical companies are also the largest single-site users in the West, where single-site revenue accounts for 26% of large user income. In the North, only 15% of large user income comes from single sites. Retail and the public sector account for between 46% of large user revenue in the East to 50% in the North. Again, the significance of the petrochemical sector is obvious in the East.

Table 13.21: Revenue from large users

Large users	East		North		West	
	Revenue	%	Revenue	%	Revenue	%
Retail	£8.9m	18%	£3.9m	11%	£6.3m	11%
Public Sector	£13.4m	28%	£17.1m	48%	£21.8m	37%
Commercial	£1.4m	3%	£2.2m	6%	£2.5m	4%
Manufacturing	£1.2m	2%	£1.4m	4%	£4.0m	7%
Services	£2.0m	4%	£1.2m	3%	£1.3m	2%
Petrochemicals	£11.9m	25%	£3.1m	9%	£5.2m	9%
Food Manufacture	£1.1m	2%	£2.1m	6%	£2.9m	5%
Utilities	£2.8m	6%	£3.2m	9%	£4.5m	8%
Drinks/Breweries	£1.6m	3%	£1.0m	3%	£5.3m	9%
Hi-Tech Manufacture	£2.8m	6%	£0.1m	0%	£3.3m	6%
Voluntary Sector	£0.0m	0%	£0.0m	0%	£0.0m	0%
Pharmaceuticals	£1.2m	3%	£0.2m	1%	£1.8m	3%
Textiles Manufacture	£0.2m	0%	£0.3m	1%	£0.7m	1%
Agricultural	£0.0m	0%	£0.0m	0%	£0.0m	0%
Totals (rounded)	**£48.5m**	**100%**	**£35.8m**	**100%**	**£59.4m**	**100%**

Table 13.22: Revenue from non-domestic sector

Non-domestic sector	East		North		West	
	Revenue	%	Revenue	%	Revenue	%
Retail	£29.9m	34%	£17.5m	20%	£21.3m	16%
Public Sector	£17.2m	19%	£20.2m	24%	£24.0m	19%
Commercial	£5.4m	6%	£8.8m	10%	£23.1m	18%
Manufacturing	£3.9m	4%	£9.8m	11%	£11.9m	9%
Services	£4.7m	5%	£10.7m	12%	£10.0m	8%
Petrochemicals	£12.0m	14%	£3.7m	4%	£5.6m	4%
Food Manufacture	£1.6m	2%	£4.8m	6%	£12.0m	9%
Utilities	£3.7m	4%	£5.3m	6%	£5.5m	4%
Drinks/Breweries	£2.2m	2%	£1.4m	2%	£5.7m	4%
Hi-Tech Manufacture	£3.8m	4%	£0.3m	0%	£4.0m	3%
Voluntary Sector	£2.1m	2%	£2.2m	3%	£2.7m	2%
Pharmaceuticals	£1.2m	1%	£0.3m	0%	£1.8m	1%
Textiles Manufacture	£0.6m	1%	£0.7m	1%	£1.5m	1%
Agricultural	£0.8m	1%	£0.6m	1%	£0.0m	0%
Totals (rounded)	**£89.1m**	**100%**	**£86.3m**	**100%**	**£129.1m**	**100%**

In terms of total non-domestic revenue, the importance of public sector and retail income becomes even more apparent. In the East, 53% of total non-domestic income comes from these two sectors, in the North 44% and in the West 35%.

The creation of the proposed Scottish Water will significantly reduce the exposure of each of the water authorities to any single sector of the economy. This will reduce the risk to the authority of a dominant customer being able to dictate terms. This will, therefore, be in the general customer interest. Table 13.23 below illustrates the most important sectors from the perspective of the proposed Scottish Water.

Table 13.23: Total revenue from non-domestic sector

Non-domestic	Over £100,000		To £100,000		Total	
	£m	%	£m	%	£m	%
Retail	£19.1m	14%	£49.6m	31%	£68.7m	23%
Public Sector	£52.3m	39%	£9.1m	6%	£61.4m	20%
Commercial	£6.1m	5%	£31.2m	19%	£37.3	12%
Manufacturing	£6.6m	5%	£19.0m	12%	£25.6m	8%
Services	£4.5m	3%	£20.9m	13%	£25.4m	8%
Petrochemicals	£20.2m	14%	£1.1m	1%	£18.4	7%
Food Manufacture	£6.1m	4%	£12.3m	8%	£14.5	6%
Utilities	£10.5m	7%	£4.0m	2%	£9.3m	5%
Drinks/Breweries	£7.9m	6%	£1.4m	1%	£8.1m	3%
Hi-Tech Manufacture	£6.2m	4%	£1.9m	1%	£7m	3%
Voluntary Sector	£0.0m	0%	£7m	4%	£3.3m	2%
Pharmaceuticals	£3.2m	2%	£0.1m	0%	£2.3m	1%
Textiles Manufacture	£1.2m	1%	£1.6m	1%	£2.8m	1%
Agricultural	£0.0m	0%	£1.4m	1%	£1.4m	0%
Totals (rounded)	**£143.7m**	**100%**	**£160.6m**	**100%**	**£304.5m**	**100%**

The public sector is a very important group of customers. It accounts for nearly 40% of large user revenues. Petrochemical and retail each account for a further 14%. These three sectors account for over 50% of all (not just large user) non-domestic income.

f) Typical amounts paid by non-domestic customers

The Charges Schemes for each authority show some quite marked differences. I have tried to illustrate what this means for some typical businesses ranging from a small newsagent to a whisky distiller, where the charges are on a measured basis. The water usage of one employee is around 25 litres per day, or $10m_3$ per annum. Trade effluent charges have not been included since I have no role in agreeing either their method of collection or their amount.

Table 13.24: Typical water bills paid by non-domestic customers

Property[2]	Water Volume 2001–02	Water Authority	Income from Standing Charge	Income from Volumetric Charge	Total
Newsagent	30m³	East	£6	£18	**£24**
		North	£74	£31	**£105**
		West	£100	£16	**£116**
Local garage	100m³	East	£43	£61	**£104**
		North	£74	£104	**£178**
		West	£100	£54	**£154**
Restaurant	500m³	East	£100	£305	**£405**
		North	£74	£521	**£595**
		West	£100	£270	**£370**
Commercial	900m³	East	£240	£549	**£789**
		North	£74	£937	**£1,011**
		West	£347	£486	**£833**
Retail (20 small stores)	4,500m³	East	£5,670	£2,745	**£8,415**
		North	£1,716	£4,685	**£6,401**
		West	£7,900	£2,431	**£10,331**
Food Manufacturers (3 meters)	50,000m³	East	£4,780	£30,500	**£35,280**
		North	£285	£52,050	**£52,335**
		West	£3,684	£27,015	**£30,699**
Food Manufacturers (4 meters)	100,000m³	East	£11,055	£61,000	**£72,055**
		North	£386	£104,100	**£104,486**
		West	£7,335	£54,030	**£61,365**
Manufacturing	175,000m³	East	£26,500	£102,175	**£128,675**
		North	£205	£170,468	**£170,673**
		West	£11,909	£90,503	**£102,412**
Drinks / Brewers (4 meters)	600,000m³	East	£36,080	£324,825	**£360,905**
		North	£490	£491,880	**£492,370**
		West	£17,905	£287,730	**£305,635**

[2] It is assumed that 1 employee uses around 27 litres of water per day, or 10m³ per annum, except where water is used in the business process. Therefore, the newsagent has 3 employees and the commercial building 90 employees.

East of Scotland Water Authority has the lowest water bill for customers who do not use much water. This is a direct result of the very low standing charge that it applies to small meters. The standing charges for East of Scotland Water Authority increase quite sharply however, with the result that its prices increase faster than those for customers in the West. At low water volumes, North of Scotland Water Authority bills for water are lower than for West of Scotland Water Authority. This reflects the lower standing charge for North of Scotland Water Authority. The authority does have a very high volumetric charge for water and this more than offsets the advantage of the lower standing charges for the large user of water.

East of Scotland Water Authority again has the lowest sewerage bills for those who are modest users of water[4]. In this instance, the low charge is principally a result of the much lower surface water drainage charges in the East. In contrast, the relatively high volumetric charge of East of Scotland Water Authority more than outweighs the company's lower surface drainage charges for the larger water user. The East actually has the highest waste water bills in Scotland for large users.

Table 13.25: Typical wastewater bills paid by non-domestic customers

Property	Waste water[3] volume	Rateable value	Water authority	Income from standing charge	Income from volumetric charge	Income from surface water charge	Total
Newsagent	28.5m³	£5,000	East	£10	£27	£35	**£72**
			North	–	£9	£397	**£405**
			West	£20	£15	£193	**£228**
Local garage	95m³	£10,000	East	£80	£91	£70	**£241**
			North	–	£29	£793	**£822**
			West	£20	£51	£386	**£457**
Restaurant	475m³	£100,000	East	£190	£456	£700	**£1,346**
			North	–	£146	£7,930	**£8,076**
			West	£20	£256	£3,860	**£4,136**
Commercial	855m³	£750,000	East	£450	£821	£5,250	**£6,521**
			North	–	£263	£59,475	**£59,738**
			West	£80	£461	£28,950	**£29,491**
Retail	4,275m³	£1,700,000	East	£10,630	£4,104	£11,900	**£26,634**
			North	–	£1,316	£134,810	**£136,126**
			West	£1,820	£2,306	£65,620	**£69,746**
Food Manufacturers	47,500m³	£100,000	East	£8,900	£45,600	£700	**£55,200**
			North	–	£14,625	£7,930	**£22,555**
			West	£880	£25,626	£3,860	**£30,366**
Food Manufacturers	95,000m³	£260,000	East	£20,760	£91,200	£1,820	**£113,780**
			North	–	£29,251	£20,618	**£49,869**
			West	£1,760	£51,253	£10,036	**£63,049**
Manufacturing	166,250m³	£1,225,000	East	£49,600	£159,600	£8,575	**£217,775**
			North	–	£51,188	£97,143	**£148,331**
			West	£2,880	£89,692	£47,285	**£139,857**
Drinks / Brewers	150,000m³	£500,000	East	£67,600	£144,000	£3,500	**£215,100**
			North	–	£46,185	£39,650	**£85,835**
			West	£4,320	£80,925	£19,300	**£104,545**

[3] Based on 2001-02 financial year.

[4] Sewerage charges are based on an assessment of water use. It is normally estimated that 95% of water used is returned to sewer.

North of Scotland Water Authority is currently transitioning to an assessed volume charge for sewerage. At the current time, the current surface water drainage charge includes both a foul water element and a surface water drainage element. This method of charging penalises those who are lower users of water but have a high rateable value (city centre premises). It will benefit those on a lower rateable value who use a lot of water. The large customers in the West of Scotland have the best deal. Elsewhere, West customers do worse than in the East but better than in the North.

g) Implications of Scottish Water

The creation of Scottish Water would bring the immediate advantage of reducing the exposure of the organisation to any single customer or group of customers. A second advantage, which would result over the next few years, is that charges would become harmonised across Scotland.

i) Domestic customers

A move to a harmonised charge would remove some of the current discrepancies in charging levels and policies. There are obvious inequities in the existing system. Households in the Borders pay more than in Dumfriesshire. In North Fife (where the costs of supplying water are quite high), charges are significantly below those in Dundee, where the costs of supply are much lower.

Many multi-site non-domestic customers have expressed concern about the extreme variations in charges that exist between the three authority areas[5]. Understandably, domestic

Table 13.26: Typical total bills paid by non-domestic customers

Property	Water authority	Total water	Total waste water	Total	Impact of using charging schemes of:		
					East	North	West
Newsagent	East	£24	£72	**£96**	0%	574%	359%
	North	£105	£405	**£511**	(60%)	0%	(33%)
	West	£116	£228	**£345**	(41%)	48%	0%
Local garage	East	£104	£241	**£345**	0%	190%	77%
	North	£178	£822	**£1,000**	(65%)	0%	(39%)
	West	£154	£457	**£611**	(44%)	64%	0%
Restaurant	East	£405	£1,346	**£1,751**	0%	731%	315%
	North	£595	£8,076	**£8,671**	(88%)	0%	(50%)
	West	£370	£4,136	**£4,506**	(76%)	100%	0%
Commercial	East	£789	£6,521	**£7,310**	0%	395%	157%
	North	£1,011	£59,738	**£60,749**	(80%)	0%	(48%)
	West	£833	£29,491	**£30,325**	(61%)	92%	0%
Retail	East	£8,415	£26,634	**£35,049**	0%	312%	128%
	North	£6,401	£136,126	**£142,527**	(75%)	0%	(44%)
	West	£10,331	£69,746	**£80,078**	(56%)	80%	0%
Food Manufacturers	East	£35,280	£55,200	**£90,480**	0%	(17%)	(33%)
	North	£52,335	£22,555	**£74,890**	21%	0%	(18%)
	West	£30,699	£30,366	**£61,065**	48%	23%	0%
Food Manufacturers	East	£72,055	£113,780	**£185,835**	0%	(17%)	(33%)
	North	£104,486	£49,869	**£154,355**	20%	0%	(19%)
	West	£61,365	£63,049	**£124,414**	49%	24%	0%
Manufacturing	East	£128,675	£217,775	**£346,450**	0%	(8%)	(30%)
	North	£170,673	£148,331	**£319,003**	9%	0%	(24%)
	West	£102,412	£139,857	**£242,268**	43%	32%	0%
Drinks / Brewers	East	£360,905	£215,100	**£576,005**	0%	0%	(29%)
	North	£492,370	£85,835	**£578,205**	(0%)	0%	(29%)
	West	£305,635	£104,545	**£410,180**	40%	41%	0%

[5] This concern has been expressed by Chambers of Commerce and small business owners who have sites in more than one authority area.

customers in the North of Scotland are dissatisfied at the higher charge levels that they face.

Customers in the different authority areas will see quite different increases in their charges as a result of the move to harmonise charges. Increases for domestic customers in the West and East areas will be higher than the overall revenue cap[6]. The harmonisation of charges can be achieved in year three (2004-05) of the four-year regulatory period. This will ease the impact of harmonisation on those who will end up paying more.

Table 13.27 illustrates my estimate of the impact on the Band D charge in each of the three authority areas as a result of harmonisation of charges. The table takes account of the additional revenue that I believe will need to come from the domestic sector. It also assumes that the balance between water and sewerage charges moves over this review period to reflect the average position in England and Wales. This is appropriate, as the majority of customers will begin to benefit from full secondary treatment of sewage during this period.

Table 13.27: Band D Charge – Impact of harmonisation

2001–02 Band D charge	East	North	West
Water	£124.50	£192.63	£138.87
Sewerage	£145.50	£157.55	£127.53
Total	**£270.00**	**£350.18**	**£266.40**
2004–05 Projected Harmonisation			
Water	c.£160	c.£160	c.£160
Sewerage	c.£183	c.£183	c.£183
2004–05 Band D charge nationally	**c.£343**	**c.£343**	**c.£343**

In 2004-05, harmonised domestic charges would be approximately £343 in total per Band D household. This compares with the current Band D charge in the East of £270.00; in the West of £266.40 and in the North of £350.18.

ii) Non-domestic customers

The mix of services used by businesses can vary quite significantly. In order to try to show what harmonisation might mean, I set out below some illustrative examples. The actual impact on any particular business will no doubt differ from this example, but in the event that the proposed Scottish Water seeks to develop tariffs that are broadly reflective of economic costs, my examples should be directionally correct. It will, of course, be for management to determine the actual method and speed of harmonisation.

I have made the following assumptions:

- I have applied the East of Scotland Water Authority standing charges to water and waste water for each business except the newsagent. These are the highest of the three authorities and the higher standing charge more accurately reflects the costs of supply to each customer. I have applied the standing charges of the West of Scotland Water Authority to the newsagent, due to the very small standing charges applied by the East to small businesses.
- I have applied the East of Scotland Water Authority volumetric charge to water. This is neither the highest nor the lowest volumetric charge.
- I have applied the West of Scotland Water Authority volumetric and surface water charges for waste water. Again, this is neither the highest nor the lowest charge.

In harmonising the tariffs, I have taken no account of increases in charges. Table 13.28 indicates the difference between the sample 2005-06 bill after harmonisation and the current 2001-02 bill of the three authorities. A figure in brackets indicates a reduction to the customer's bill.

With harmonisation there will always be winners and losers. In my example those who benefit are:

- water customers in the North (except those with very low usage and a large number of metered sites),
- low water users in the West,
- large waste water customers in the North.

Those who would lose out are:

- large water users in the West,
- waste water customers in the East.
- very small premises in the East.

[6] In Chapter 37, I discuss the outlook for prices in the East and West areas in the event that the Scottish Parliament does not endorse Scottish Water. My expectation would be that the existing authorities would find the efficiency targets much more difficult to achieve than will Scottish Water. This means that customers in the West and in the East will actually be better off under the Scottish Water proposal than they would have been under the existing arrangement.

Table 13.28: Examples of what harmonisation might mean – increase/(decrease) in 2001–02 bills

Property	Water volume	Rateable value (£)	Water authority	Water	Waste water	Total
Newsagent	30m³	£5,000	East	£94	£156	**£250**
			North	£13	(£177)	(**£164**)
			West	£2	£0	**£2**
Local garage	100m³	£10,000	East	£0	£276	**£276**
			North	(£74)	(£305)	**(£379)**
			West	(£50)	£60	**£10**
Restaurant	500m³	£100,000	East	£0	£2,960	**£2,960**
			North	(£190)	(£3,770)	**(£3,959)**
			West	£35	£170	**£205**
Commercial	900m³	£750,000	East	£0	£23,340	**£23,340**
			North	(£222)	(£29,877)	**(£30,099)**
			West	(£44)	£370	**£326**
Retail	4500m³	£1,700,000	East	£0	£51,922	**£51,922**
			North	£2015	(£57,570)	**(£55,555)**
			West	(£1,916)	£8,810	**£6,894**
Food Manufacturers	50,000m³	£100,000	East	£0	(£16,814)	**(£16,814)**
			North	(£17,055)	£15,831	**(£1,224)**
			West	£4,581	£8,020	**£12,601**
Food Manufacturers	100,000m³	£260,000	East	£0	(£31,732)	**(£31,732)**
			North	(£32,431)	£32,180	**(£251)**
			West	£10,690	£19,000	**£29,690**
Manufacturing	175,000m³	£1,225,000	East	£0	(£31,198)	**(£31,198)**
			North	(£41,998)	£38,246	**(£3,752)**
			West	£26,264	£46,720	**£72,984**
Drinks/Brewer	600,000m³	£500,000	East	£0	(£47,275)	**(£47,275)**
			North	(£131,465)	£81,990	**(£49,475)**
			West	£55,270	£63,280	**£118,550**

h) Implications of current pricing structures

There are a number of challenges facing the industry in Scotland in respect of harmonising charges, and ensuring that these charges are cost reflective. My analysis highlights that there will be customers who benefit from harmonisation, but there will also be some customers who are worse off. The key is that those who are worse off are not asked to pay a price significantly in excess of the costs of supply. However this analysis does not address two other important issues implicit in the current pricing structures. These are the balance between metered and un-metered revenues and secondly, the relative prices and costs of supply of small businesses and households. Both of these issues have implications for revenue, which I have attempted to quantify.

i) Metered and un-metered

The switch to metering has resulted in a significant reduction in the non-domestic customer chargeable base of the water authorities. The impact in the East of Scotland Water Authority is estimated at 14% in 2001-02 and 20% the previous year (assuming a 10% price increase in both years). West of Scotland Water Authority, which is less further forward in its metering programme, estimated the reduction in the customer chargeable base in 2001-02 at 8% (assuming a 10% price increase).

The price elasticity of demand for water is increased when there is a large volumetric element in the charging for the supply of water. Essentially, customers can reduce their bill by reducing their consumption of water. This does not reflect the

Table 13.29: Split of water revenues – metered and un-metered

Non-Domestic water revenues £ms	East		North		West		Scotland	
Metered	£46.5m	100%	£30.1m	83%	£41.1m	80%	£117.7m	88%
Non-metered	n/a	0%	£6.0m	17%	£10.3m	20%	£16.3m	12%
Non-domestic water total	**£46.5m**	**100%**	**£36.1m**	**100%**	**£51.4m**	**100%**	**£134.0m**	**100%**

Table 13.30: Split of waste water revenues – metered and un-metered

Non-Domestic waste water revenues £ms	East		North		West		Scotland	
Metered	£42.6m	100%	£34.3m	68%	£15.6m	20%	£92.5m	54%
Non-metered	N/a		£15.9m	32%	£62.1m	80%	£78.0m	46%
Non-domestic waste water total	**£42.6m**	**100%**	**£50.2m**	**100%**	**£77.7m**	**100%**	**£170.5m**	**100%**

costs of supply as the actual costs depend to only a very limited extent on the amount of water supplied. The largest element of cost relates to the cost of access to the networks. If costs are properly allocated and tariffs are broadly reflective of costs then this decline in the chargeable base should be halted and may in some cases be reversed.

Most water is already supplied on a metered basis so the scope for further erosion of the chargeable base should be significantly reduced. It would further seem likely that most customers who felt that they would benefit from installing a meter have already switched.

Table 13.29 illustrates the split of non-domestic water revenues between metered and un-metered customers. 88% of non-domestic water customers are already metered. Even if there is a further decline in the chargeable base as a result of switching to meters, this is likely to have only a very marginal impact on revenue. I would estimate that this risk is not likely to be more than about £3 million.

The percentage of metered waste water revenues is significantly lower than for water. In particular, only 20% of non-domestic revenue in the West is metered. I estimate that the maximum revenue impact could reach 20% of the 46% of the unmetered revenues. This equates to £16 million. The extent of the risk to revenue in both water and waste water can be substantially limited by the introduction of higher standing charges. This is in the general customer interest.

The introduction of broadly cost reflective charges can limit and perhaps in some cases reverse the declines in the chargeable base that have been experienced in the last few years. It is important that customer charges broadly reflect their use of the system. In particular it should be remembered that use of the system does not mean only water use, it also includes the benefits provided simply by having the connection to the water and sewerage system.

ii) Small business charges

Tables 13.31-13.33 illustrate the small business charges for water in each of the three authority areas.

Table 13.31: East of Scotland Water Authority

Water Volume/ Meter Size	6mm[7]	8mm	10mm
20m³	£18.20		
60m³		£48.60	
120m³			£94.20

Table 13.32: North of Scotland Water Authority

Water Volume/ Meter Size	Up to 25mm
20m³	£94.82
60m³	£136.46
90m³	£167.69
120m³	£198.92

[7] East of Scotland Water Authority applies a theoretical meter size calculation. The meter sizes of 6mm, 8mm and 10mm are compatible with the volumes used in my example, according to the East of Scotland Water Authority Schedule of Charges 2001/02, Appendix B.

Table 13.33: West of Scotland Water Authority

Water Volume/ Meter Size	20mm	25mm
20m³	£110.81	£357.81
60m³	£132.42	£379.42
90m³	£148.63	£395.63
120m³	£164.84	£411.84

Charges for small businesses are typically less than those paid by households. This does not reflect the economics of supply. It will be important to explain to the small business community why their charges are likely to have to increase.

i) The impact of competition

The previous chapter outlined the potential development of competition in the Scottish water industry. I believe that in the market competition (i.e. real choice for customers) will develop only in the retail component of the value chain. If the Scottish industry approaches the efficiency frontier and designs tariffs that broadly reflect costs, then the risk to revenue in a network and treatment business should be limited.

There is, however, a greater risk to revenue in the retail activity. There are two main reasons for this. The first is that there is a significant problem with non-payment in Scotland. The second is the potential growth in bundled services.

Bad debt in Scotland is partly caused by poor billing and management of receivables by the authorities; partly by some domestic customers choosing not to pay; and partly by customers who have a genuine problem affording their water bill (I will discuss this in more detail in Chapter 24).

There is an increasing number of retail-focussed businesses offering utility services. This includes companies like Centrica, Powergen and Innogy. Each of these companies offers electricity, gas and telephone services. These product offers are being expanded to include financial and other household services. They offer the convenience of a single bill and single point of contact. There would seem to be some evidence that customers are on occasion prepared to pay a little more for this extra convenience.

Potential entry to the Scottish retail market will be made easier by the high level of non-collection of charges in Scotland. New entrants are likely to be able to offer services primarily to those who will pay. This would inevitably mean that they will be lower cost and these benefits could be passed on to the customer in the form of lower charges.

New entrants to the Scottish market may also be able to benefit from economies of scale and of scope in the provision of a retail service. Again, these cost benefits could be passed on to customers in lower prices. They may also be able to offer a more convenient service to customers with a 'bundled bill'.

I need to understand the potential impact of retail competition on the revenues of the existing water authorities. The discounts available to customers for switching gas or electricity supplier suggest that the revenue of the water industry could be materially affected. My approach was to gather information from the water authorities on the costs incurred in providing a retail service. I compared these costs to the spending of the privatised companies in England and Wales. I have concluded that the threat to revenue is real (largely because of the non-payment problem), but that the impact of this on the overall funding of the industry is not great.

The information I requested covered all aspects of the retail function. I asked for information on costs associated with:

- customer billing,
- meter reading,
- call centre services,
- key account management,
- debt recovery
- bad debt.

The responses from the water authorities are outlined in Table 13.34.

Table 13.34: Costs of the retail function, across the three authorities 2000–01

Retail supply function	Domestic operating costs	Non-domestic operating costs	Total
Billing	£0.4m	£3.5m	**£3.9m**
Call centre	£1.3m	£0.6m	**£1.9m**
Meter reading	£0m	£1.5m	**£1.5m**
Key account management	£0m	£1.6m	**£1.6m**
Debt recovery	£8.3m	£5.2m	**£13.5m**
Bad debt	£25.5m	£16.0m	**£41.5m**
Local authority charge for billing & collection	£11.5m	£0m	**£11.5m**
Total	**£47.0m**	**£28.4m**	**£75.4m**

The water authorities were not able to produce detailed capital costs for the retail function. I have assumed for this analysis that the annual depreciation charge on capital in Scotland is £25 million. Earning the average return on retail assets would add a further £8.5 million per year. The total costs of the retail business are £100.4 million annually. The total revenue that it is appropriate to allocate to the retail business is £108.9 million.

Table 13.35 shows the proportion of retail operating costs compared with total operating costs.

Retail costs appear to represent around 18% of total water authority operating costs. This is a higher percentage than in the comparator companies in England and Wales, as shown in Table 13.36.[8]

NB: South West Water data is for 1999-00, as 2000-01 accounts were not available at the time of writing.

There are two main reasons why retail costs represent a high percentage of total operating costs:

- high bad debt levels
- comparative inefficiency

Accordingly, I have made adjustments to the total retail costs of £75.4 million for each of these in turn.

A large proportion of the costs incurred in the retail function result from the non-collection of revenue. Bad debt accounts for £41.5 million, which is 55% of total retail operating costs. The total bad debt charge across Scotland is 5.5% of revenue.

Table 13.35: Split of retail and non-retail costs

2000–01 water authority operating cost	Domestic		Non-domestic		Total	
	£	%	£	%	£	%
Retail	£47.0m	14.3%	£28.4m	16.8%	**£75.4m**	**18%**
Non-retail	£234.7m	85.7%	£112.9m	83.2%	**£347.6m**	**82%**
Total	**£281.7m**	**100%**	**£141.3m**	**100%**	**£423.0m**	**100%**

Table 13.36: Comparison of Scottish Water compared with companies in England and Wales

2000–01 Operating cost	Scottish Water		Yorkshire Water		Northumbrian Water		South West Water	
	£	%	£	%	£	%	£	%
Retail	£75.4m	18%	£25.3m	12%	£25.9m	14%	£8.3m	9%
Non-retail	£347.6m	82%	£193.9m	88%	£155.3m	86%	£79.7m	91%
Total	**£423.0m**	**100%**	**£219.2m**	**100%**	**£181.2m**	**100%**	**£88.0m**	**100%**

[8] NB: South West Water data is for 1999-00, as 2000-01 accounts were not available at the time of writing.

If this charge were to be reduced to the average level in England and Wales, the operating costs incurred in retail function would be reduced by 39%. This has been weighted 60%/40% between the domestic and non-domestic sector to reflect the approximate split of bad debt in Scotland.

Table 13.37: Adjustment to retail operating costs for reduced bad debt

	Domestic	Non-domestic	Total
Retail operating cost	£47.0m	£28.4m	£75.4m
Bad debt reduction	**£17.6m**	**£11.8m**	**£29.4m**

It has also been discussed in Chapter 24 that the water authorities are around 50% less efficient than the average in England and Wales. As the bad debt levels will form a significant part of this inefficiency and have already been adjusted for, I have stripped out bad debt and calculated an inefficiency adjustment of 35% of the balance.

Table 13.38: Adjustment to retail operating costs for inefficiency

	Domestic	Non-domestic	Total
Retail operating cost	£47.0m	£28.4m	£75.4m
Deduct bad debt	(£24.9m)	(£16.6m)	(£41.5m)
Total	£22.1m	£11.8m	£33.9m
Inefficiency adjustment	**£7.7m**	**£4.1m**	**£11.8m**

Therefore, if the water authorities were as efficient as the companies in England and Wales the retail operating costs would be as shown in Table 13.39.

Table 13.39: Retail operating costs adjusted for inefficiency and reduced bad debt

Water authority retail operating costs	£75.4m
Bad debt reduction	(£29.4m)
Inefficiency adjustment	(£11.8m)
Revised retail operating costs	**£34.2m**

A further adjustment is required as a greater level of customer service is provided in England and Wales for the monies spent. To enhance service levels will require significant additional expenditure in the Water Authorities. I have estimated the increased costs required at one-third, after stripping out bad debt. This is outlined in Table 13.40.

Table 13.40: Cost of increasing customer service levels

Water authority retail operating costs	£75.4m
Deduct bad debt	(£41.5m)
Total	£33.9m
Cost of increase in service levels (33%)	**£11.3m**

Table 13.41 shows that the retail operating costs following the customer service level adjustment would be around £45.5 million.

Table 13.41: Retail operating costs with allowance for increased service

Water authority retail operating costs	£75.4m
Retail operating cost (with reduced bad debt and inefficiency adjustment)	£34.2m
Increase in service levels	£11.3m
Total	**£45.5m**

Therefore, if the water authorities were operating as efficiently and effectively as the companies in England and Wales the retail operating costs would be £45.5 million. However, if they continue to operate inefficiently and with high bad debt levels then the retail operating costs would be £90.7 million, as shown in Table 13.42.

Table 13.42: Retail operating cost at current level of efficiency and bad debt

Retail operating cost	£75.4m
Increase in service levels	£11.3m
Inefficiency in service level adjustment	£4.0m
Total	**£90.7m**

The relative competitive position of the Scottish industry becomes clearer if we look at all costs as a proportion of revenue. There is no information about the capital equipment used by the privatised companies. I have therefore made the assumption that they too use £100 million of capital, which is depreciated over four years. This assumption penalises Northumbrian Water and South West Water because they are smaller organisations and there will be economies of scale in the billing systems used. I have included their actual cost of capital, which is 6.8% nominal, and the required return is therefore equal to £6.8 million per year. I have included two scenarios for the proposed Scottish Water. The minimum scenario outlines the position where the authorities are at the

Table 13.43: Retail revenue as a percentage of total revenue

2000–01	Scottish Water (minimum)	Scottish Water (maximum)	Yorkshire Water	Northumbrian Water	South West Water
Retail operating costs	£45.5m	£90.7m	£25.3m	£25.9m	£8.3m
Depreciation	£25m	£25m	£25m	£25m	£25m
Return on capital	£8.5m	£8.5m	£6.8m	£6.8m	£6.8m
Total retail revenue required	£79.0m	£124.2m	£57.1m	£57.7m	£40.1m
Total revenue	**£746.3m**	**£746.3m**	**£543.6m**	**£405.1m**	**£243.4m**
% of revenue	**10.6%**	**16.7%**	**10.5%**	**14.2%**	**16.5%**

same levels of efficiency as their comparators, with reduced bad debt and higher service levels. The maximum scenario is where the Authorities are operating at current levels of efficiency and bad debt, but with higher service levels to enable a valid comparison with England and Wales.

My analysis would suggest that unless bad debt and inefficiency are addressed, a new entrant could benefit from an additional margin of some £45 million. If I assume that 60% of cost is attributable to domestic customers, then the potential average discount, which a new entrant could offer to domestic customers of the water authorities is £12.

It is likely that retail-focused companies with economies of scale and scope such as Centrica, Powergen and Innogy could achieve larger margins than this if they entered the Scottish market. This results from the economies of scope and scale from which they would benefit.

j) Potential revenue impact of competition

In Chapter 12, I discussed the loss of market share that was experienced by British Gas in the years after the market was liberalised. If the proposed Scottish Water were to experience the same percentage reduction in its retail business as was experienced by British Gas from 1993 onwards in the commercial/industrial sector, then retail revenue would decline as shown in Table 13.44.

Table 13.44: Potential decline in retail revenue (commercial/industrial)

Year	Decline on prior year	Cumulative decline
Year One	23%	23%
Year Two	34%	49%
Year Three	19%	59%
Year Four	20%	67%

The loss of market share of domestic customers has not been as rapid since liberalisation of the domestic market in 1997-98. By February 1999, 21.7% of domestic customers had switched. I have assumed that the rate of decline continues as follows:

Table 13.45: Potential decline in retail revenue (domestic)

Year	Decline on prior year	Cumulative decline
Year One	11%	11%
Year Two	12%	22%
Year Three	10%	30%
Year Four	10%	37%

In order to calculate the overall decline in retail revenue I have applied a weighting of 60% to domestic customers and 40% to the commercial/industrial sector. The results are shown in the table below.

Table 13.46: Potential decline in retail revenue (commercial/industrial and domestic)

Year	Decline on prior year	Cumulative decline
Year One	16%	16%
Year Two	17%	30%
Year Three	9%	37%
Year Four	7%	41%

This table assumes that competition is possible for domestic and non-domestic customers at the same time. Competition begins in Year 0.

The total revenue for the proposed Scottish Water in 2000-01 would have been £746.3 million (excluding inter-authority trading). The retail proportion would have been £108.9 million. The loss in revenue for the company's retail business would therefore be as set out in Table 13.47.

Table 13.47: Revenue decline in Scottish Water

Year	Retail revenue
Year Zero	£108.9m
Year One	£91.5m
Year Two	£75.9m
Year Three	£69.1m
Year Four	£64.3m

The impact on the proposed Scottish Water as a whole would be significantly less, as shown in Table 13.48.

Table 13.48 does not take into account any increases in tariff and is in constant prices.

The maximum revenue exposure is not significant relative to the benefit to customers that results from the achievement of the efficiency targets. If retail market share declines at the rate of British Gas, the impact on total revenue at year 4 is estimated to be £45 million. To put this in perspective, if the operating cost efficiency targets are only 50% achieved, then the cost to customers is £185 million. The priority from a customer standpoint is clear. The total retail gross margin for an average household is approximately £50. Even if significant economies of scale are available, there would not seem to be the opportunity to reduce bills by as large a sum as in the electricity or gas sectors. Even £15 for an average household would seem quite a large discount unless the current significant inefficiency is addressed. It is unlikely, therefore, that customers will switch suppliers for the extent of the saving on the bill.

Experience from other utilities has demonstrated that retail competition has brought choice to customers, better levels of service and lower prices. These lower prices have resulted partly from more efficient provision of the retail service, but also because the retail suppliers have applied pressure on the natural monopolies to reduce costs. This will benefit customers.

Choice will inevitably improve levels of service. The scope for reducing charges to attract customers away from an efficient incumbent is quite limited. It is therefore the level of service that is likely to be critical to customer retention. Customers, it would seem, can only benefit from the introduction of competition: there will be lower prices and better levels of service in the competitive market than if the current monopoly were to remain.

k) Conclusions

There has been much debate about the potential threat from competition. The threat has been exaggerated, unless the industry in Scotland fails to achieve its efficiency targets, does not develop broadly cost reflective tariffs and fails to improve its customer service. These are all within the control of the management of the Scottish water industry. Retail competition, even in a worst case scenario, should be less important from a customer standpoint than 25% of the total efficiency target for the industry. The key therefore is to address competition pro-actively and to do this by focusing at least as much on reducing costs as on improving customer service. If management is successful in so doing, then all customers will benefit.

Table 13.48: Impact of revenue decline on Scottish Water

Year	Total revenue	% Decline	Cumulative Decline
Year Zero	£746.3m	0%	0%
Year One	£728.9m	2%	2%
Year Two	£713.3m	2%	4%
Year Three	£706.5m	1%	5%
Year Four	£701.7m	1%	6%

Section 3: Chapter 14
Competition: Cost Transparency

a) Introduction

There are two broad types of product or service that can be supplied to customers. There are those where the customer has a high degree of discretion and is influenced by price, style, image and/or perception in varying degrees. And there are other types of service, such as the utilities, where price alone is the dominant factor in the decision making process. Water is particularly unique as the fixed cost element is quite exceptional[1]. Although service levels are important in the utility sector, this is mainly in the context of mitigating or avoiding problems or improving the convenience offered to the customer. The result is that utility services are priced on primarily a cost plus appropriate return basis. As such, it is reducing costs that will be the best way to retain customers.

One of the primary functions of regulation is to ensure that costs are kept at the minimum level consistent with a sustainable and improving level of service. The recommendations contained in this chapter are designed to ensure that there is a continuing pressure on the water industry in Scotland to deliver the service at the lowest realistic price. Accounting separation of business (discussed below) and the increased in the market competition which results, will essentially play the same role as it did in the other utilities, i.e. it will increase the pressure for efficiency.

b) Comparative and market competition

Regulators will continue to use benchmarking as their primary weapon in determining the allowable costs for a monopolistic utility, and the return on capital that it should be able to earn. This mechanism has been very successful in generating greater efficiency in the water industry in England. This contrasts with market competition, which has played to date only a very minor role.

These improvements, whilst significant, do not compare with the improvements that have been seen in the electricity and gas industries. The developments in the electricity and gas industries have been partly a function of regulatory pressure, but also of increasing competition. There was a pressure placed on the vertically integrated suppliers in gas and electricity to dismantle their existing vertical integration and to separate out those activities that could clearly be made competitive. This process increased the number of market places and supplier/customer relationships and results in for the market competition becoming similar in its effect to in the market competition (e.g. a meter reading business is focused on its customer, the retail service provider).

This de-aggregation has two principal effects. Firstly, competition to provide a service will increase innovation and efficiency. Second, it allows the regulator to benchmark the components of the vertically integrated organisation with a much higher degree of confidence. This will almost certainly highlight improvements that even the most effective and efficient company can make.

It is not only customers and regulators who benefit from this process of fragmentation of the value chain. Managers also benefit. They are able to assess more clearly which activities they are good at and where weaknesses lie. Current econometric models broadly reflect the various activities of a water business. However, the relative ranking of the benchmarked organisations for each model is, at best, of very limited relevance. This is because cost allocation by activity across the organisations will undoubtedly vary and may not reflect actual incidence of cost. These differences in cost allocation policies result in the regulator being able to establish relative efficiency for the organisation as a whole, but not being able, with any confidence, to assess relative efficiency at a functional level. Increased transparency of costs across functions can better assist managers in determining where to focus their efforts and, consequently, where to invest. This allows managers to align their activities with their business competences and will facilitate their achievement of efficiency. It will also help bring to light new opportunities. If, for example, a company sees that it is particularly good (i.e. efficient and innovative) at operating assets, then it may be possible to sell this expertise to another service provider in the market. This will, as a consequence, reduce overall costs in the market.

c) Importance of understanding costs

When a vertically integrated incumbent is faced with challenges at discrete points in its value chain (as opposed to across the whole value chain) it must be able to allocate its costs accurately if it is to succeed. This lesson has been learned by other incumbent suppliers of utility services (see Chapter 12).

[1] See discussion in Chapter 11.

The discussion on access charges for the use of essential facilities in Chapter 11 also addressed this issue.

Attempting to cover costs that were inappropriately allocated to a particular business by pricing too high will lead either to an accelerated loss of business (if this is a competitive activity) or to a challenge to the Office of Fair Trading (if the activity is a natural monopoly). It is therefore critical to ensure that costs are properly understood and allocated on an activity basis.

Much can be learned from the experience of the gas and electricity industries in implementing accounting separation of the various activities comprising the vertically integrated value chain. The best chance of achieving efficiencies and ensuring competitiveness will be if this separation is achieved willingly (see discussion of British Gas and British Telecom, Chapter 12).

d) Accounting separation

There are two accounting actions that will help better position the proposed Scottish Water in terms of providing value to all customers. Firstly there should be an appropriate degree of accounting separation; second, management should adopt a rigorous internal cost allocation process based on activity based costing.

Accounting separation is key to ensuring value for money over the long term for customers. This accounting separation can take place within a single organisation, or be forced by full legal separation. It is also possible to imagine an accounting split within a single organisation that has been required by the terms of a license. The greater the formalisation of the separation, the less easy it is likely to be to challenge the accuracy of the cost accounting. Accounting separation brought about by the terms of a license may be more open to challenge than when there is full legal separation, but it is more robust than a voluntary separation of activities implemented by owner or managers.

From the standpoint of the regulator, there is likely to be little difference between the possible reasons for an accounting separation. It will be possible to benchmark levels of cost and service and to identify the scope for further efficiencies. Targets can still be set, which should ensure that value for money for customers continues to increase. The only real risk is that there will be an opportunity for gaming by management in order to receive a more favourable regulatory settlement. This clearly would not be in the interests of customers.

Customers are likely to benefit more when there is greater separation. This is for two reasons. The clearer the rules of the game, the more likely it is that a potential new entrant will take the steps necessary to enter the market. As discussed above, increased competition is likely to benefit all customers. The second reason is that when the conditions for accounting separation are imposed externally, there is less opportunity for the management to allocate costs in a way that puts them in a favourable light. This inevitably reduces the opportunity for gaming (flexibility allowing greater achievability of targets) and means that it will be much more difficult for management to retain value at the expense of the customer.

To ensure that customers receive the full benefit of the efficiencies that can be realised, an external discipline must be applied and should be seen to apply. For example, a detailed instruction from the owner is more likely to ensure that benefits of the fragmenting value chain are available to customers. However, a simpler instruction from owner to authority that they abide by the same accounting disciplines as required by other players in the market injects the extra clarity, which can result from a license condition. This reduces the flexibility available to management and ensures that more benefits accrue to customers.

e) Activity based costing

Activity based costing is designed to ensure that the true cost of each activity undertaken to supply a service is properly understood. Management that has this information will be significantly better placed to benchmark itself internally[2] and externally against other similar organisations. It will also help management respond to the pressures of competition or to the targets of the regulator. Customers will benefit as a result.

At present there is little understanding of costs in the Scottish water authorities; this is true both in the accounting and in the economic sense. It must be a priority of management and of

[2] Internal benchmarking is by far the easiest for a management to implement. It involves comparing the practices and processes of one part of the organisation with another and ensuring that plans are put in place to bring all similar areas into line with best practice. External benchmarking across organisations requires more work to ensure that like is being compared with like.

regulation to ensure that this understanding of costs improves not only at the macro level of the authority, but also at the detailed business process level. This will be a critical factor in the survival of the public sector model for the industry.

f) Importance for Scottish water industry

It is vital that the Scottish water industry is able to charge a fair price for the services that are provided to customers. This requires a detailed understanding of the infrastructure and equipment that is used in serving a customer (or group of customers) and the cost of providing this service. Accounting separation will also ultimately make it easier to justify the tariff levied. Furthermore, full activity based costing within an accounting separation becomes easier to implement. The priority clearly would go to those costs, which are incurred in serving the largest customers. It is these large customers who are most likely to move off-network if tariffs are not reflective of economic value.

i) Supplier of last resort

This is a difficult service to price[3]. Pricing will depend firstly on which last resort service is required by the customer. If a service is required on demand, the service infrastructure would have to be maintained such that the service could be provided whenever, or if ever, this was required. Service to customers can be summarised as comprising three elements:

- an access charge
- a customer service charge (administration of the account etc)
- a volumetric charge.

The first and second of these would apply to a customer who only wanted an on demand supplier of last resort contract. The access charge is likely to be the same whether or not water was supplied. The economic cost of providing the pipe remains approximately the same as the rate of deterioration of the pipe would be just as quick, if not more so, if no water is being used. The access charge would also cover the costs of the water or sewage treatment capacity reserved for that customer. There may be small savings in customer service if no water is being used, but these are likely to be immaterial. Clearly, there would be no volumetric charge.

An exception to this could arise if the water supplier were able to oversell capacity (as is frequently done in the airline industry) and could interrupt supplies to others if called upon to provide a supply urgently. In most cases, there would be little opportunity to juggle supplies successfully, at least in the very short run. Even the introduction of an interruptible tariff would not help a great deal as the interruptions would tend to be of a fundamental, rather than short-term operational nature.

In the event that a customer does want to maintain a supplier of last resort link with the water supplier, but does not require this to be available on demand, then there would be the opportunity to manage capacity in the network and this could reduce the access charge that would be payable. The administration charge however may be higher. Again the volumetric charge would be nil.

This would not apply in the case where the supplier of last resort connection accounted for a particularly large percentage of capacity. In this case, it may be appropriate for the customer to pay a reconnection fee, which would amount to the long run marginal cost of the connection. This would probably be cheaper than maintaining operational readiness on the existing connection.

In each case, correct pricing would require a full understanding of the infrastructure required and the costs associated with making this available to the customer. These costs would have to be calculated in a manner that is sufficiently robust for the customer to understand the costing and its implications. It must also be clear that there can be no question of unfair allocations of costs; if so, they could form the subject of an appeal to OFT.

ii) Fixed and volumetric tariffs

If the method of pricing does not reflect the way in which costs are incurred, incentives can be created that may not be to the benefit of the wider customer base or to the incumbent supplier. To charge on a variable volumetric tariff for the recovery of fixed costs will be a significant incentive to the customer to reduce the volumes they consume to a minimum. This may result in the service being provided, unintentionally, below a full economic cost. The volumetric charge is only appropriate either to reflect the variable elements of the costs (i.e. some of the costs of the delivered water) or if some limits are placed on the volumes to

[3] This has been discussed in more detail in Chapter 11. A summary is provided here to illustrate the importance of correct cost allocation.

be charged. For example, so long as sufficient units are sold on a volumetric basis in order that fixed costs are covered, then there is no impact on other customers.

The key issue is again the need to ensure full and proper understanding of the costs of providing the service and the nature of those costs (i.e. their variability).

g) Benefits to customers

An efficient public sector monopoly should provide the lowest costs to customers. It would benefit from a very low cost of capital and, as an efficient monopoly, should be able to lever economies of scale in favour of customers.

Accounting separation of the major activities will ensure that a proper focus and efficiency develops. This does not preclude competition for the market within the existing vertically integrated structure; quite the reverse, reaching the efficiency frontier may actually require market testing of business processes. Cost transparency and negotiation with customers will reveal the true nature of costs and will drive efficiency forward. Regulation will be facilitated by accounting separation and better allocation of costs and this too will help to ensure that customers get a better deal. The process of negotiation with customers will also focus on customer service, and this should lead to further improvements in this area.

A better understanding and allocation of costs is likely to reduce the number of off-network deals. This will be in the long run interest of all customers.

Similarly, if the network is being operated efficiently, the costs of access will make common carriage unattractive and limit competition in the market to the retail end of the value chain.