

## 30 Years of technical and organisational development in the UK water sector: Thames Water's experiences of moving from public to private sector

Tony Rachwal

### ABSTRACT

This paper highlights for an international audience, the major technical, socio-economic and political changes which the UK water industry has faced over the period 1974–2006. The author also provides a personal experience of the technical and environmental challenges met by Thames Water in this period. The formation of publicly owned Water Authorities to implement integrated river basin water management is discussed. Government drivers for privatisation and the formation of water industry regulators are reviewed. Privatisation has had impacts on improved water quality and customer service, higher capital investment and changes to pricing mechanisms. A wide range of public and private ownership and service delivery models are now used in the UK water industry.

**Key words** | customer, privatisation, regulation, technology, Thames, UK

**Tony Rachwal**  
Managing Partner, Tony Rachwal and Associates,  
6 Molesey Park Road, West Molesey,  
Surrey KT8 2LE,  
UK  
E-mail: [tonyrachwal@tiscali.co.uk](mailto:tonyrachwal@tiscali.co.uk)

### INTRODUCTION – EARLY PRIVATE AND PUBLIC OWNERSHIP MODELS

The concept of public or private ownership and operating models for water and wastewater services is not new. Roman and Greek civilisations 2000 years ago developed large-scale public funded aqueducts and also developed smaller private estate, water and wastewater assets and operations. In the UK, a notable private-funded water supply venture was completed in 1613. This was the 50 kilometre long, New River project to supply London with freshwater from distant groundwater springs (Barty-King 1992). An entrepreneur named Sir Hugh Myddelton and merchant adventure partners raised a shareholding of £18,000 to form the Company of the New River. The only public participation was that of King, James I, who was given part of the equity in return for supporting land acquisition. The private New River Company developed storage reservoirs, wooden, trunk main pipe networks and lead supply pipes into wealthier customer's homes. Water carriers supplied poorer customers with buckets of water charging 1 penny a pail for their carrying services. The

shareholders took dividends from this profitable and long-lived (300 years) private enterprise and eventually the New River Company was sold and together with the operations of other private water companies became, in 1904, the public Metropolitan Water Board for London. Following a further 85 years of public ownership, a second privatisation venture resulted in the company Thames Water Plc, who as a private water company still operates some of the original private sector funded assets of the New River Company. This changing private and public ownership model has been repeated throughout recent UK history.

A large proportion of drinking water organisations in the UK also started as privately funded ventures in the period 1800–1900, later moving into public ownership by town and city organisations in the 20th century. Sewerage and wastewater services were less popular for private funding with most “customers” initially unwilling to pay for such services in the UK, an experience shared globally in the 20th century. The major sewerage schemes for London were therefore

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publicly funded following “The Year of the Great Stink” in 1858, which closed the Government’s Houses of Parliament because of the smell of sewage in the river Thames. Over the period 1800–1974 many thousands of both privately and publicly funded water service organisations and a similar number of publicly owned wastewater, sewerage and drainage organisations developed across the UK.

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### **1974: FORMATION OF PUBLIC UK WATER AUTHORITIES – RIVER BASIN MANAGEMENT MODEL**

In 1974, the UK adopted the principle of integrated river basin water management, consolidating hundreds of the publicly owned water and wastewater organisations into 10 large regional Water Authorities for England and Wales. Thames Water Authority was the largest of these new integrated river basin water management authorities, with responsibilities for water resources, navigation, drinking water supply, wastewater treatment and flood control for 13 million customers in London and the surrounding River Thames catchments of 13,000 square kilometres. Equalisation of charging mechanisms for customers, adoption of river water quality objectives and models for wastewater effluent discharge consents and economics of scale from common design and operational technical standards were key activities of the public Water Authorities during their existence from 1974 to 1989. For Thames Water, major technical achievements were improvements to many large wastewater treatment plants that enabled the return of salmon to the river Thames in Central London and the completion of the Thames Barrier to protect London from sea flooding. Many benefits were obtained from the formation of the publicly owned river basin management Water Authorities. However, their identified need for increased capital investment challenged the financial targets of the UK public sector borrowing requirements. The UK Government began to explore new financial, regulatory and ownership models.

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### **1989: PRIVATISATION OF UK WATER INDUSTRY**

During the 1980s, the UK Government adopted a policy of privatisation of many publicly owned organisations and

services. There was a particular focus on creating privately owned and financed telecommunications, gas, electricity and water utilities. Expected benefits included a reduction in future public sector borrowing for capital projects, revenue to the treasury for sale of public assets and more rapid adoption of private sector operational and business management efficiency practices including new technology.

A new governmental regulatory framework was developed to counterbalance what in some cases might be seen as natural monopolies. In most utility cases only one regulator, responsible for customer service levels and prices, was established. However water was deemed to need 3 regulators, the Water Services Regulation Authority (OFWAT) for customer service, prices and investment planning, the Environment Agency (EA) for water resources and environmental protection and the Drinking Water Inspectorate (DWI) for drinking water quality and protection of public health.

The process of privatisation of the regional Water Authorities resulted in the flotation of 10 new water and sewerage utility companies on the UK London stock market in 1989. At the same time the UK Government agreed to a timetable to implement the European Union Drinking Water Directive which required major investment in advanced water treatment processes to remove pesticides, chlorinated disinfection by-products and other industrial micro-pollutants. The opportunity to also implement previous UK legislation to improve wastewater effluent quality was also taken. In Thames Water this was to require a £0.5 billion programme (where 1 billion =  $10^9$ ) to install ozone and granular activated carbon advanced water treatment at all surface water treatment plants and £0.25 billion for an 80 km, 2.5 m diameter London Water Ring Main Tunnel.

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### **REGULATOR CONTROL OF CUSTOMER PRICES**

The customer and investment regulator OFWAT recognised that the very large increases in privately financed capital investment needed would justify price increases to customers. A series of 5 year asset management plans (AMP) were established with pricing based on a formula of retail price index (RPI) minus efficiency (X) plus new quality (Q)

obligations (RPI – X + Q) with a set rate of return on capital invested. The planning periods 1989 to 1999 referred to as AMP1 and 2 resulted in a 3 to 4 fold increase in capital investment and the UK moving from “the dirty man of Europe” media image to achieving probably the highest national overall compliance with EU drinking water and wastewater quality standards. Customers were getting better drinking water and river water quality after 10 years of private ownership and operation but a combination of the price rises and operational profits declared resulted in OFWAT introducing a price cut for the AMP3 period 2000–2005. This can be seen in Figure 1, which shows average household bills for water and sewerage charges over the 17 years of private ownership (OFWAT 2006). Currently the UK Water Industry is operating in the AMP4 period (2006–2010) with a large increase in investment in renewing underground water and wastewater network assets.

The average annual household bill in England and Wales for 2006/07 is £294 for water and wastewater services (water is £142, wastewater £152). This is a real term increase of 39% or 2% per year over the 17 years since privatisation (OFWAT 2006). In the same time period, £55 billion has been invested from private finance. The average bill varies amongst the different regional water companies according to the regional asset and cost base of providing water and wastewater (Figure 2). As an example, the largest water and wastewater company’s (Thames Water) average bill of £265 represents

the major economics of scale from operating a few, older and very large treatment plants for London’s customers compared to the average bill of £450 for customers in the smaller and more geographically dispersed South West Water which has needed many new coastal, wastewater treatment plants. Within a water company region all customers are charged on the same formula basis so that city dwellers may be providing some subsidy for more expensive water supplies to small and remote communities.

### CUSTOMER BILLING – RATEABLE VALUE OR METERING

The UK is unusual in that relatively few domestic customers water supplies are metered with most customers billed on an assessed “rateable value” of their property rather than on volume of water supplied or wastewater treated. This has historically been a socio-political decision whereby the wealthier and high “rateable value” property owner or tenant has been deemed to be a high water user and also provides a subsidy for the poorer “low rateable value” property owner or tenant. Industrial and commercial customers are metered. This principle has not changed between public and private ownership.

During the period of regional Water Authority operation (1974–1989) a policy of water metering of all new

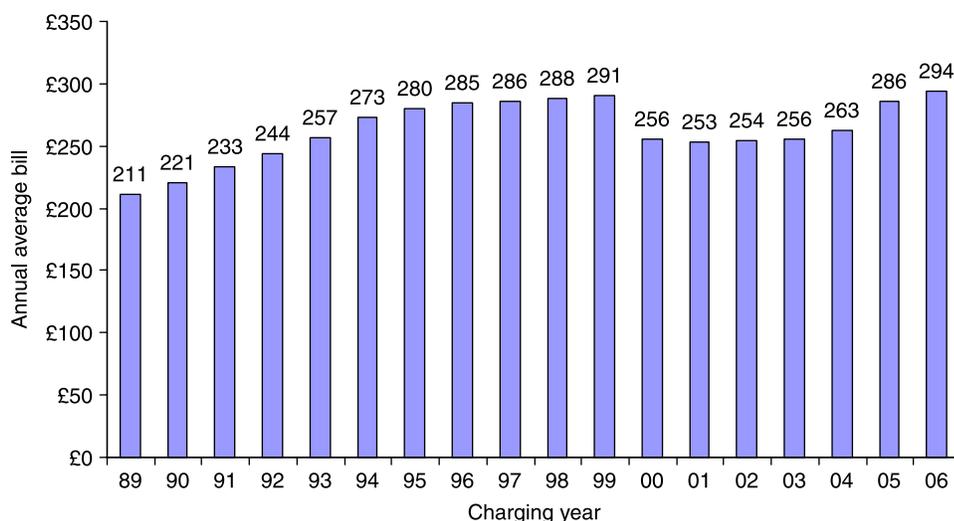


Figure 1 | Average household bills from 1989–2006 (today’s prices).

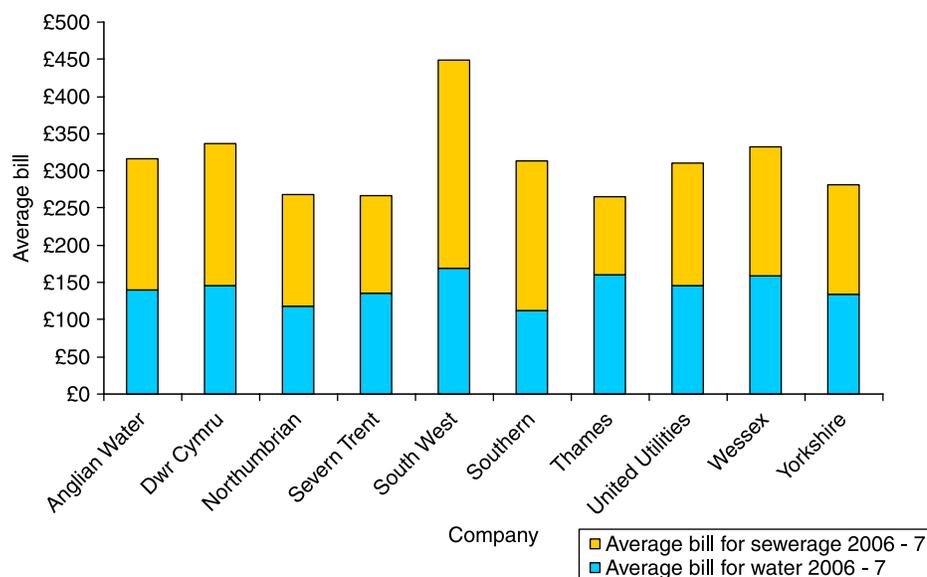


Figure 2 | Comparison of water and sewerage companies household bills 2006–07.

domestic properties was adopted. Post-privatisation (1989) customers also have the option of choosing to have a water meter installed if they believe their water bills will be reduced from the property rateable value basis. Water companies cannot compulsorily meter existing properties unless the occupiers can be proved to be high users with for example swimming pools and garden irrigation systems or a water resource zone is deemed to have high water resource stress. In 2006, approximately 30% of domestic customers now have metered water supplies compared to less than 5% in 1974. The UK metered price of water averages £1/m<sup>3</sup> for water and £0.9/m<sup>3</sup> for wastewater in 2006. For comparison, Thames Water prices are £0.95/m<sup>3</sup> for drinking water and £0.47/m<sup>3</sup> for wastewater. Following privatisation the government also removed the option for water companies to cut-off supplies to customers for non-payment of bills. This is not the case for privatised electricity and gas utilities and has increased the cost of bad debt financial provision for private water companies.

## LEVELS OF CUSTOMER SERVICE

The OFWAT regulator not only provides customers with control on prices whilst giving a fair return for private capital investment but also provides a comparative

framework for levels of customer service. This was a major change in valuing and informing customers about their water and wastewater services after privatisation.

Each year the water and sewerage companies in England and Wales provide OFWAT with information on their performance against various measures of service. These are:

- DG2 Inadequate pressure
- DG3 Supply interruptions
- DG4 Restrictions on use of water
- DG5 Flooding from sewers
- DG6 Billing contacts
- DG7 Written complaints
- DG8 Bills for metered customers
- DG9 Ease of telephone contact

The comparative performance of each water company can be viewed on the OFWAT website (<http://www.ofwat.gov.uk/>). Similar comparative performance tables are published on the Environment Agency website (<http://www.environment-agency.gov.uk/>) for wastewater effluent quality and the Drinking Water Inspectorate (<http://www.dwi.gov.uk/>) for drinking water quality.

Companies are judged on their overall Operating Performance Assessment (OPA) of their levels of service and can be financially rewarded or penalised by OFWAT in

their 5-year price and investment reviews. Customers can also be refunded part of their bills if DG3 unplanned supply interruptions, for example from bursts, exceed set time limits.

### NEW TECHNOLOGY FOR CUSTOMER SERVICE

In addition to the expected evolution of more investment in new technology for water and wastewater treatment and pipe network infrastructure, there has been a near revolution in customer communication and billing systems. Not all of this can be attributed to the change from public to private ownership but a significant driver has been a perception that customers demand a higher service level from a profit making business. The “one stop shop” call centre for telephone and mail contact was rare prior to privatisation in 1989 but became nearly universal in the UK before 2000. In common with other service industries web based contact, meter reading and billing is growing. Appointments to provide customer services are made within specific time periods with fines payable if not kept by the water utility.

### CHANGING OWNERSHIP AND PUBLIC/PRIVATE MODELS

The simple UK stock market private shareholder ownership model of integrated water and wastewater services has diversified widely since 1989. Companies have reviewed different types of activity for either internal delivery or external outsourcing. Welsh Water (Dwr Cymru) out-sources all capital works, operations and customer service activities. Other water companies have taken on part of the outsourcing opportunities so that for example Thames Water operates the customer centre for Welsh Water and provides capital asset delivery management for Scottish Water. Some water companies are now part of UK or international multi-utilities, others are owned by investment banks. In Scotland and Northern Ireland water assets remain publicly owned but use private finance for part of their operations.

### CHANGING TECHNOLOGY NEEDS

In the UK the technical emphasis of water sector investment is changing from improving water and wastewater quality, of which much improvement has been achieved, to renewing and maintaining buried network infrastructure. Pipe networks represent 60–70% of all water utility asset value. London was fortunate to have the benefit of some of the earliest piped water and sewage services in the period 1800–1900. However, many of these network assets are still in use and have reached the end of their service life. Thames Water is replacing more than 1500 km of London’s water pipes over the period 2005–2010.

The combined impacts of increasing water use, finite fresh water resources and climate change are also driving major changes in perception of the value of water resources and potential new water sources such as water reuse and desalination of saline water. Thames Water is awaiting the result of a planning enquiry into a proposed 140,000 m<sup>3</sup>/d brackish water desalination plant for London.

The author predicts that renewal and maintenance of buried urban water and sewerage networks and development of new water resource and demand management technologies will continue to be a major area of investment for the first half of the 21st century regardless of the water industry business model adopted. How the public or private sector models deal with future longer-term issues such as climate change and sustainable water infrastructure and services is the next challenge.

### DISCLAIMER

The views expressed in this paper are those of the author and not necessarily those of Thames Water.

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