

Every Drop Counts

Achieving greater water efficiency

Louise Every
with Julie Foley

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Contents

About the authors	4
Acknowledgements	4
Executive summary	5
1. Introduction	8
2. The need and potential for more water-efficient homes	10
A secure and sustainable water future	10
Contribution to tackling water affordability	13
Energy savings and other environmental benefits	13
The potential for improving household water efficiency	14
Summary of findings	15
3. The twin-track approach to balancing supply and demand	16
Tackling leakage	17
Promoting water saving	18
Summary of findings	18
4. Improving domestic water efficiency	19
Water companies	19
Public authorities	23
Government	24
Summary of findings	26
5. Progressing metering	28
Greater metering in water-stressed areas	29
Integrating metering and other demand management measures into water resource plans over the medium to longer term	30
Smart meters for smarter tariffs	31
Supporting poorer families and vulnerable groups	31
Summary of recommendations	32
6. Introducing water efficiency targets	34
Targets for water saving – some considerations	34
Feasibility of a Water Efficiency Commitment	35
How do we get there?	40
References	42
Appendix 1. Duties to promote water efficiency	46
Appendix 2a Calculations on water company activity on water efficiency	47
Appendix 2b Calculations on water company activity on supply pipe leakage	49

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Executive summary

Water is a precious and increasingly scarce resource in many parts of the world. The drought of 2004-2006 has raised awareness of the fragility of water resources in parts of the UK and helped push water issues up the political agenda. There is a growing awareness that there are areas where demand for water is close to outstripping supply (Environment Agency, 2001). Yet there is a real need to accommodate a rising population, living in smaller, more numerous households particularly in the parts of the Greater South East where water availability is scarcest. Furthermore, climate change could result in more frequent droughts over the mid to longer term. If we are to manage water resources more sustainably, there needs to be a radical change in how we as a society value, manage and consume water.

As a shared but limited resource, people, businesses and the Government have a collective responsibility to use water wisely and ensure its consumption and production remain within environmental limits. Water companies are expected to balance water supply and demand following the twin-track approach, but the current regulatory approach to water resource planning arguably encourages an 'either/or' selection of demand management or supply-side options. The regulatory system currently rewards supply expansion and water company plans tend to be biased towards supply-side measures. Yet there is significant scope for water savings in new and existing homes. Potential water savings in the existing housing stock are estimated to range from 12 to 30 per cent (MTP, 2006 and SDC, 2006).

Much of recent public and media attention has focused on leakage. In fact, most companies are meeting their leakage targets and overall leakage has reduced by around 1400 mega litres (Ml) per day over the course of the last ten years (Ofwat, 2006a). The focus on leakage reduction has overshadowed other key forms of demand management – metering and promoting water saving by customers – which are under-developed.

Although water companies have a duty to promote the efficient use of water by their customers and further water conservation, total expenditure and attributable water savings from companies' water efficiency activities have declined since 1997. Most companies undertake a minimum level of water efficiency activity, often entailing cheap (as opposed to cost-effective) measures, which deliver small and transient savings. On average, water companies in the Greater South East spent 11.5p and saved 250ml or the equivalent of a mug of water a day per person per year through household water efficiency (excluding supply pipe leakage) activities between 2002 and 2005. This compares to an average spend in England and Wales of 10.5p and savings of 327ml or the equivalent of a can of soda a day per person per year. The current duty for water companies to promote water efficiency and conservation by its customers is not ensuring that companies in water-stressed areas are delivering more water savings at the household level.

It is not just water companies that have a responsibility to deliver water savings. Local authorities and other public bodies also have a duty to take into account water conservation and are well placed to work in partnership with stakeholders to deliver water savings. Local authorities could consider making water conservation a material consideration in Local Development Frameworks, and producing supplementary planning guidance to encourage water-efficient new homes. Central government has a critical role to play in using product and building regulations to prevent the installation of the least efficient products from the market. It could also consider whether all homes should be graded against the forthcoming Code for Sustainable Homes. The Department for Environment, Food and Rural Affairs (Defra) is looking at the feasibility of developing a voluntary product information labelling scheme. If it is understood by consumers and adopted by the majority of manufacturers and retailers, the label could be instrumental in influencing purchasing behaviour and transforming the market for water-efficient goods.

However, greater effort is needed to encourage more water-efficient homes. Last year, the Government established a Water Saving Group to work in partnership with the water companies, the Consumer Council for Water, Waterwise and the water regulators (Ofwat and the Environment Agency) to develop options for encouraging households to reduce consumption and use water more efficiently. This report particularly considers two of the most contentious issues the group is considering – options for progressing metering and introducing water efficiency targets.

Proposals for progressing metering

Water metering encourages a more efficient use of water by householders. In England and Wales, only 28 per cent of domestic customers are metered. This lags behind many other developed nations that are 100 per cent metered (for single family houses). Metering enables water to be charged according to how much is used, which is a fair way of paying for water use. Research has shown that the water savings from household metering are between 10 and 15 per cent in the UK, with significantly larger peak demand savings. This report recommends that:

- There should be an acceleration of compulsory metering in water-stressed areas – which will largely be in the Greater South East.
- The Government should take forward the proposals of the Water Saving Group to:
 - streamline the water scarcity status process to make it easier for water companies to apply in the coming years
 - integrate the assessment of metering and other demand management proposals into the new statutory Water Resource Management Plans to be published in 2009.
 - In tandem with the above, the Environment Agency should publish a map of England and Wales identifying ‘water-stressed’ areas. Members of the Water Saving Group and other stakeholders should urge companies in areas that have been identified as water stressed to apply for water scarcity status.
- If metering rates are to be rapidly progressed, government, the regulators, water companies, and consumer groups need to fully evaluate and clearly communicate the net benefits of introducing smart meters and of potential multi-utility smart metering as a matter of urgency.
- Water companies need to do more to promote greater customer awareness and take up of the existing vulnerable groups’ tariff.
- Central to winning public and political support for further water metering will be the development of better safeguards for supporting poorer households and vulnerable groups. Over the longer term, this could involve the design of innovative social tariffs.
- In the interim, as metering levels progressively rise, there are two options that could be taken forward, either together or separately:
 1. Expansion of the Vulnerable Groups Scheme to cover a wider range of low income customers.
 2. A Government-funded ‘water affordability’ grant scheme similar to the ‘Warm Front’ scheme that helps qualifying households by providing grants to metered households to improve the water efficiency of their homes.
- In the absence of a current indicator for water affordability, the Government should develop a water affordability benchmark in time for the next periodic review in 2009. This could be developed from the Government’s original sustainability indicator that customers should spend no more than 3 per cent of household income on water and sewerage bills.

Proposals for introducing water efficiency targets

While water companies have targets for reducing leakage, and have to ensure security of supply, they do not have targets for improving the efficiency of water use, especially in homes, which could make a significant contribution to ensuring security of supply over the longer term. The report examines the feasibility of introducing a water equivalent to the current Energy Efficiency Commitment (EEC) – an obligation on energy suppliers to improve domestic energy efficiency – and what lessons the water sector can learn from the energy sector’s experiences.

It recommends that while a straight hydro copy of the EEC would not be feasible, a Water Efficiency Commitment (WEC) inspired by the EEC could help to ensure a secure and sustainable supply of water for households. There is the potential to move towards developing a full scheme to start in 2014-15. The report outlines the key principles of the scheme and suggests a route to implementation in line with the five-yearly price review periods.

Principal recommendations

- The Government should develop a voluntary benchmark for the domestic per capita consumption (pcc) of water. This would be used as a measure of good practice for sustainable water consumption. Progress towards the benchmark should be monitored by the Environment Agency.
- The Government should work with water companies, regulators and consumer groups to develop a Water Efficiency Commitment, whereby companies are set water efficiency targets to deliver gross water savings. There should be a national minimum water efficiency target and enhanced targets for water-stressed areas. Ofwat should administer the scheme. The scheme would be trialled on a voluntary basis initially, but move towards statutory status by 2014-15.
- The Government should identify a 'priority group' of low income and vulnerable households and set an obligation on companies to meet a proportion of water savings in priority households.
- Only water efficiency measures with an acceptable level of confidence in the water savings would qualify for inclusion in the scheme. All water savings must be due to company effort, and water companies would have the freedom to meet the target however they chose. There would be an expectation that companies would work with third parties to deliver water savings.
- A WEC should be supported by appropriate institutions, guidance and policy instruments. For example:
 - The remit of the Energy Saving Trust could be expanded to include water.
 - Water companies should have clear guidance on what they are expected to do under the Water Act 2003 duty to further water conservation. In the context of a WEC, this should include a requirement to meet their water efficiency targets, encouragement to conduct educational and informational programmes to promote water conservation, and to undertake relevant research where appropriate.
 - Similarly, public bodies should have clear guidance on what their potential roles and responsibilities are specifically in relation to a WEC.

Timeline for a Water Efficiency Commitment

Action from now to 2009

- The Government should commit to developing a national benchmark for per capita consumption of water. To inform this, the Government could encourage companies to develop their own company (or regional) pcc benchmarks for water consumption.
- The Government should commit to setting water efficiency targets for water companies, through a Water Efficiency Commitment. Water companies should be encouraged to meet these targets as part of their duty to further water conservation (under the Water Act 2003).
- Government and other stakeholders should develop a water affordability benchmark and use this to identify a 'priority group' of low income and vulnerable households.
- Government should identify how to most effectively disperse water efficiency advice and funding information.
- Ofwat should set up a demand management unit to co-ordinate the development and administration of a Water Efficiency Commitment.

Action from 2009 to 2014

- Water companies could start a formalised voluntary Water Efficiency Commitment.
- There should be a joint review of the effectiveness of the voluntary approach to water efficiency targets with a view to mandating targets. This review should be conducted in a timely fashion so that mandatory targets could be set through the 2014 periodic review.

Action from 2014

- If recommended, water efficiency targets are placed on a statutory footing. The level and effectiveness of targets is fully reviewed every five years in line with the periodic review.

1. Introduction

Water is a precious and increasingly scarce resource in many parts of the world (UN-Water, 2006; WBCSD, 2006). The drought of 2004–2006 has raised awareness of the fragility of water resources in parts of the UK and helped push water issues up the political agenda. Households use 68.5 per cent of the billed water supplied by companies with the rest used by non-household customers (Ofwat, 2005). There is a growing awareness that in some areas demand for water is unsustainable and is close to exceeding environmental limits. Yet there is a real need to accommodate a rising population, living in smaller, more numerous households in the parts of the Greater South East where water availability is scarcest.

If we are to manage water resources more sustainably then there needs to be a radical change in how we as a society value, manage and consume water. One of the Government's priorities for future water policy is to 'encourage less wasteful use of water both in the home and by business' (Defra, 2002). In October 2005, the Department for Environment, Food and Rural Affairs (Defra) formed the new Water Saving Group, working in partnership with the Department for Communities and Local Government (DCLG), Water UK, the water regulators, the Consumer Council for Water and Waterwise.

As argued by the Commission on Sustainable Development in the South East (ippr, 2005), to maintain the balance of supply and demand for water it will be essential to develop some new supplies, but where the overall benefits to society outweigh the costs, demand-side measures can and must play an increasing role. The water infrastructure should become more efficient (from source to pipes to taps) and consumers more aware of, and responsive to, the changing water situation and the difficulty and trade-offs of providing high quality water for unlimited use. Improving efficiency and greater demand responsiveness will, over the longer term, improve resilience to an increased risk of drought due to climate change and/or enable development in areas where water availability is limited. The right balance must be struck between supply and demand, with full awareness that decisions taken today could 'lock in' certain consumer or demand cultures for decades to come.

This report aims to stimulate debate on how to encourage greater water efficiency and water saving behaviour (see Box 1.1) in existing homes and to influence the ongoing work of the Water Saving Group. It provides an overview of the need to improve water efficiency and why the current twin-track approach of balancing supply and demand is currently tilted towards supply-side measures. There is no silver bullet to achieving higher levels of water efficiency and a range of issues complicate the development of policies and policy instruments (Box 1.2). There needs to be a package of measures, including building regulations, product regulations, incentive schemes and public awareness programmes. This report focuses on two of the most contentious options for reducing water use: water metering and water efficiency targets.

In England and Wales, 28 per cent of domestic customers are metered (Ofwat, 2006b). Many other developed nations are 100 per cent metered (for single family homes). Unmetered households have no means of knowing how much water they use or how much it costs. This report examines options for accelerating metering rates, particularly in water-stressed areas.

We also examine water efficiency targets and whether the current duty for water companies to promote water efficiency could be turned into a commitment to deliver quantified water savings. The report looks at the feasibility of introducing a water equivalent to the current Energy Efficiency Commitment (EEC) – an obligation on energy suppliers to improve domestic energy efficiency – and what lessons the water sector can learn from the energy sector's experiences.

1. In this report we use the term 'Greater South East' in a general way and do not relate it to a specific administrative area. This is because sometimes the region is referred to in terms of water company areas and sometimes in terms of administrative areas and the two are not identical. The water companies that ippr identifies as being in the 'Greater South East' are listed in appendices 2a and 2b.

Box 1.1 Water efficiency and water conservation: definitions

Water efficiency – using less water to derive the same water service (for example, through altering or replacing an existing appliance with a more efficient one).

Water conservation – using less water through a change in behaviour to reduce waste. It can also relate to using grey, green or rain water for non-potable needs.

Source: Sustainable Development Commission (2006)

Box. 1.2. What are some of the challenges for encouraging water efficiency?

- **Water resource issues are variable across the UK and over time.** The value of saving a unit of water will vary accordingly. Unlike energy efficiency there is not a one-size fits all approach to water efficiency.
- **Water is essential for life and access to a safe, adequate supply of water is regarded by many as a humanitarian right.** Water for essential purposes should be affordable and incentives to save water should not compromise sanitation, but if water is 'too cheap' it may not send enough of a price signal to influence demand.
- **A minority of households in the UK pay for water on a metered basis.** Most people do not know how much water they use and have no direct financial incentive to use less. But metering and associated tariffs are controversial, creating a different set of winners and losers from the current system.
- **People's relationship with water is complex.** People value the environment but few relate their water use to its environmental impact. Many perceive water as plentiful throughout the UK and a proportion is resentful of restrictions on water use, even as a drought response. People do not consciously think of their water use in terms of the actual water used, but in terms of the service it provides, for example, cleansing. People's practices are often highly routinised and embedded within a set of social norms, which complicates efforts to influence behaviour (Medd and Shove, 2005).
- **There is some public mistrust of the motives of water companies in encouraging customers to use less water.** This is amplified when companies fail to meet the required level of service, including leakage targets, and report significant rises in profits, sometimes simultaneously.
- **The evidence base on the cost-effectiveness of demand management measures is not as robust as for supply-side measures.** This is partly due to the influence of behaviour on demand and other factors influencing performance such as variable water pressure. Companies have struggled to secure funding for large-scale water efficiency trials through the periodic review water-pricing process. This is in contrast to the funding of investigative work on supply-side measures.
- **Water efficiency technologies have a low market uptake.** There may be an assumption with both the public and with some trades groups that water-efficient products are of lesser quality, giving a poorer performance than higher-water-using products. There is a lack of public information about water-efficient products and devices for homes, no labelling scheme in place, and no incentives for domestic consumers to buy them.

2. The need and potential for more water-efficient homes

A secure and sustainable water future

Customers rate having a safe, reliable and continuous supply of water as the most important service provided by water companies (MVA, 2003). Water companies are under a statutory duty to supply sufficient water to meet demand for domestic purposes, whether from new or existing customers. But there are challenges to ensuring that the water supply-demand balance continues to be met and that this is achieved while respecting environmental limits. Pressures are found on both sides of the water supply-demand balance.

Supply: variation in water availability

Water companies operate on localised distribution networks with some regional bulk water transfers. There is no national grid for water. Water is abstracted under licence from surface and groundwater sources. Environment Agency assessments of water availability indicate the unevenness of the water resource situation. Figure 2.1 indicates the situation for groundwater resources.

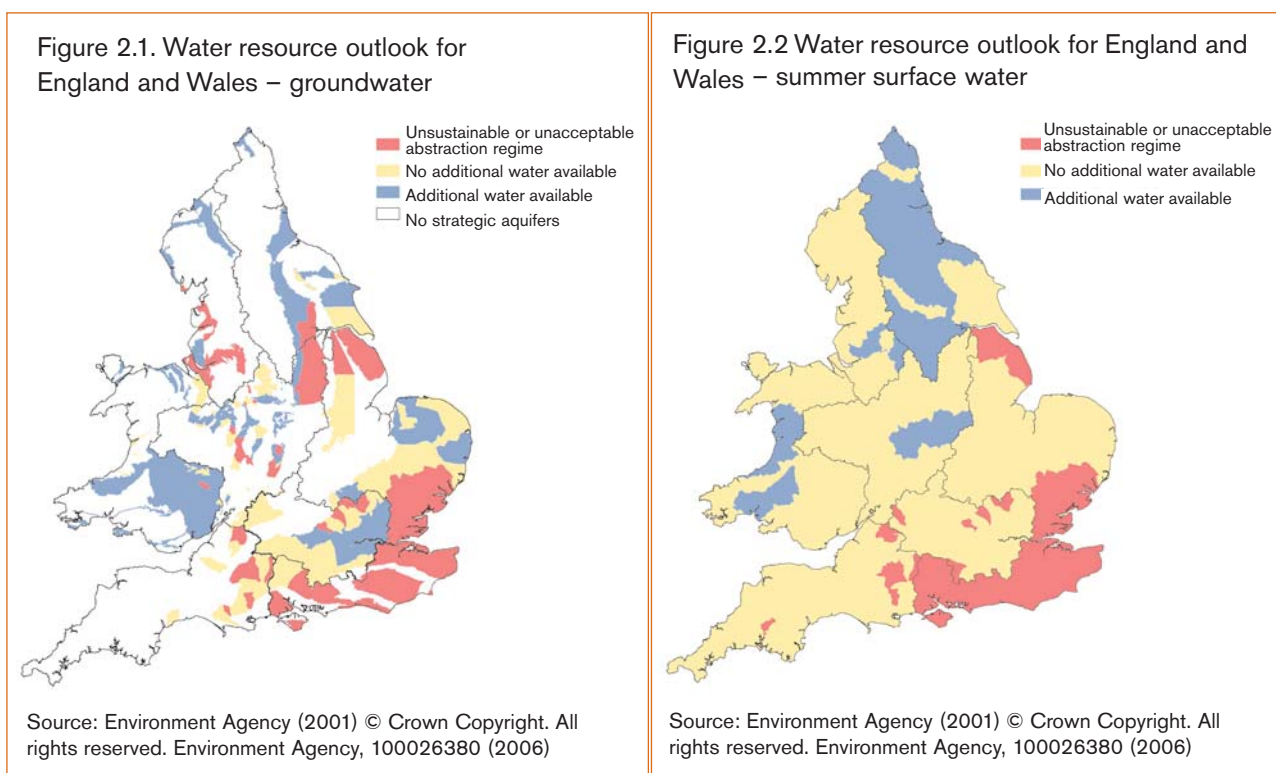
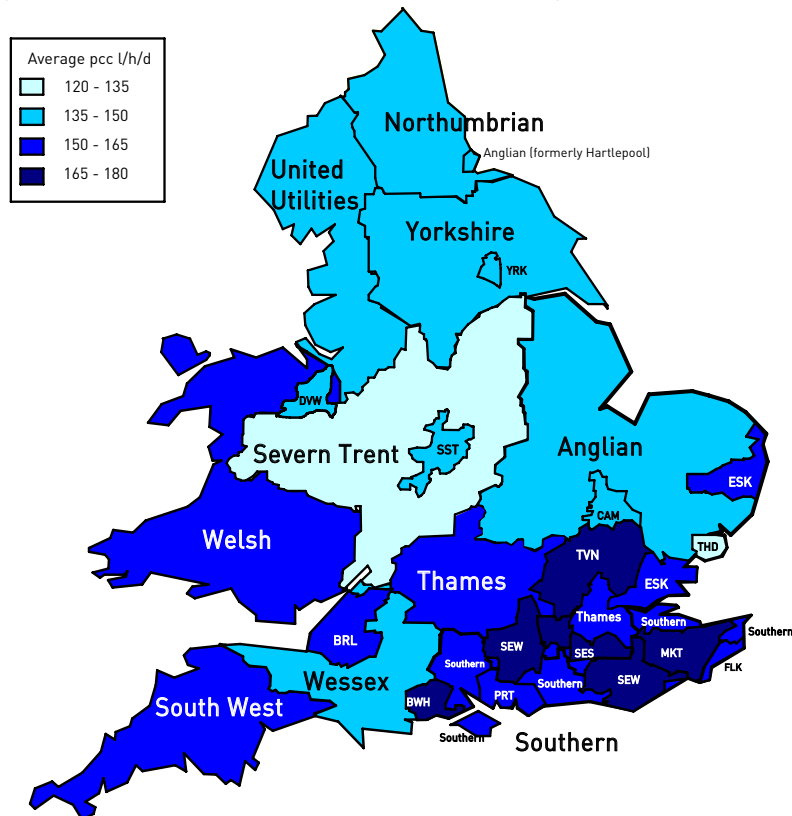


Figure 2.2 shows that abstractions from surface water are at their limit in the summer for much of England and Wales. In the winter, surface water abstractions continue to be at their limit for parts of the South and East. Unsustainable abstractions put at risk the ability of the UK to meet environmental standards set out in European legislation, most notably the Habitats Directive and the Water Framework Directive (WFD). Under the WFD, 'good' ecological status must be achieved in water bodies by 2015, which will be a challenge for the UK. Reducing abstractions from sensitive sites will be key to the protection of water bodies.

Water availability varies over time. Rainfall is lowest in the summer and much of what falls evaporates or is used by plants. The summer dip in supply coincides with peak demand. Planning and investing for the summer peak is responsible for much of the forecast growth of public water supply in England and Wales (Herrington, 1998). While groundwater sources provide a buffer against short-term water shortages, areas more dependent on surface water abstractions are vulnerable to acute periods of dry weather. The South East is highly reliant on groundwater. The two successive dry winters of 2004/05 and 2005/06 have restricted the replenishing of groundwater levels. This helps explain why the region has been so seriously affected by the current drought.

Figure 2.3 Average household per capita consumption across England and Wales (2004-05)



KEY: BRL: Bristol Water plc; BWH: Bournemouth & West Hampshire plc; CAM: Cambridge Water Company plc; DVW: Dee Valley Water plc; ESK: Essex & Suffolk Water plc; FLK: Folkestone & Dover Water Services Ltd; MKT: Mid Kent Water plc; PRT: Portsmouth Water plc; SES: Sutton & East Surrey Water plc; SEW: South East Water Ltd; SST: South Staffordshire Water plc; THD: Tendring Hundred Water Services Ltd; TVN: Three Valleys & North Surrey Water plc

Source: Ofwat (2006c)

Climate change will influence water availability over the medium to longer term. Climate models predict an increase in the frequency of ‘extreme’ six-month rainfall droughts for all UK regions. In the South East and South West extreme drought conditions could occur every two in three years by the 2080s, with droughts perhaps occurring two and three times as frequently in the 2020s and 2050s as compared to the 1961-1990 period (Wade *et al*, 2006, forthcoming). Adaptations in water resources policy and practice will be required, particularly in ‘hot spots’ where there are high development pressures. Adaptations may include improvements to drought risk management, variable water charges, changes to agricultural irrigation practices, land use planning and building regulations and new resource development alongside demand management schemes (ibid). All water users will have to adapt their water-using behaviour to some degree to ensure a continuous supply is maintained.

Demand: water consumption

Water consumption is considered in terms of per capita consumption (pcc) and total demand. Pcc relates to how much water one person uses over time, expressed as litres per person (or per head) per day (l/p/d) and is determined by the ownership, nature and use of individual water-using fittings and appliances in the home. Total demand refers to the total amount of water used by all consumers and can include industry, agriculture and leakage as well as households.

Per capita water demand

In 2004-05, the average combined per capita consumption (pcc) of water (both unmeasured and measured) in England and Wales was approximately 150 l/p/d (Ofwat and Defra, 2006). There are wide variations² in levels of pcc (Figure 2.3) and further research is required to understand the basis of these. On average,

2. Unmeasured pcc is an estimation due to low rates of domestic metering. All pcc figures should be treated with caution as methods for their calculation differ across water companies and internationally.

people in the Greater South East consume 160 l/p/d – 10 litres more than the national average (Environment Agency, 2006). To put this into perspective, France's average pcc is 164 l/p/d, New South Wales, Australia's is 412 l/p/d, while Denmark and Germany both report 127 l/p/d (Butler and Ali Memon, 2006; DEC(NSW), 2003). In the last ten years pcc in England and Wales has been relatively steady overall, partly as a result of demand management (Ofwat and Defra, 2006). This is in contrast to energy consumption, where domestic demand has grown by an average of 1.5 per cent per annum (DTI, 2006).

Water company resource plans for the next 25 years forecast that average pcc will rise, particularly in the Greater South East. Household occupancy is a key driver of pcc growth as it increases with decreased occupancy. In a single-person household, pcc is 40 per cent higher than in a two-person household (Butler and Ali Memon, 2006). The number of single-person households is projected to increase by around a third across the Greater South East between 2001 and 2026 (ODPM, 2006). Work on future scenarios produced for the Environment Agency suggests that socio-economic change may result in large increases or large decreases in demand for water, depending on changes in population, GDP, uptake of water saving technology, leakage control and social attitudes towards water use and the environment (Environment Agency, 2001). However, since 2001 the scenario that the UK has been most closely following is that of 'World Markets' (ECI, 2005: 25), which predicts large increases in pcc. So while it is unclear what will happen to future pcc levels, unless there is something of a radical socio-economic and policy shift, it is likely that there will be a rise in unmeasured pcc.

Total water demand

The Government's housing growth plans have led to concern about future pressures on water resources. The Sustainable Communities Plan outlined the potential for an additional 200,000 homes, above those currently planned in regional planning guidance, over the period to 2016. A significant proportion will be in the designated Growth Areas of the Thames Gateway, Milton Keynes-South Midlands, London-Stansted-Cambridge and Ashford (ODPM, 2003). The aspiration in the Government's recent Barker Review response to the Plan was for an extra 50,000 homes per year over the next decade, raising the annual build rate to 200,000 homes per year (HMT and ODPM, 2005). These figures have been disputed (ippr, 2005), but recent work by ippr suggests that the planned-for levels of housing growth as set out in the proposed regional spatial strategies are likely to be inadequate (Bennett *et al*, 2006). It is expected that these additional homes will be located in the Greater South East in the Growth Areas and in a range of Growth Points³.

A recent report by the House of Lords Science and Technology Committee criticised the Government for 'failing to consider the water management implications of their house-building plans at an early enough stage' (HoL Science and Technology Committee, 2006). The Government has denied that the additional demands on water resources had not been considered (DCLG, 2006a).

Approximately 12,500 MI/day of water is currently delivered to billed customers in England and Wales. A Government-commissioned study projected that nationally new demand for water will increase by about 6 per cent up to 2016, as a result of a rising population and new homes being built (ODPM, 2005a). The study looked at what additional water would be needed if house building were to go beyond that recommended in the Sustainable Communities Plan to take up the proposals in the Barker Review. It found that even under the high growth scenario (100,000 additional homes) the increase in water use would be marginal – an extra 0.1-0.2 per cent more in 2016 and an extra 0.6 per cent more in 2031.

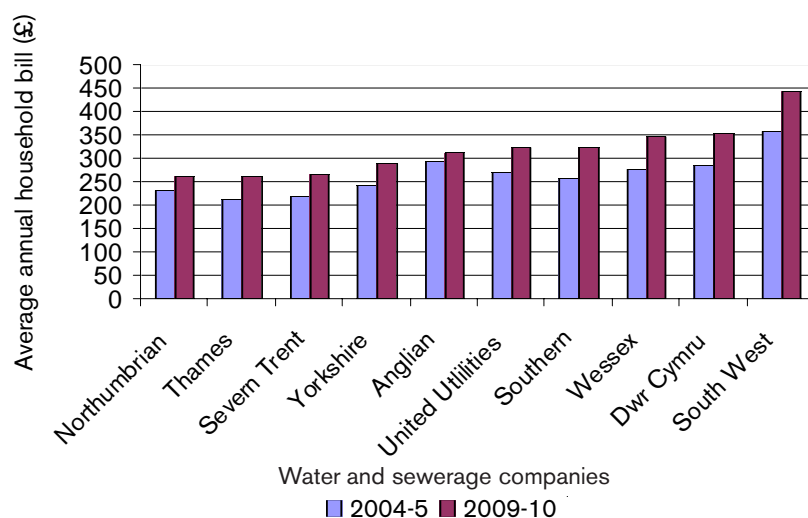
The findings of this study are disputed (MacDonald, 2006) and seem at odds with other studies, such as that produced for the South East Plan by the Water Resources in the South East Group (WRSE Group, 2005; see also ippr, 2005; Sim *et al*, 2005). There appears to be no consensus on the extent to which the Government's new housing plans will create additional demands for water. This is an area where further research and analysis by the Government, regional assemblies, Ofwat, the Environment Agency and water companies would be valuable. Work is being undertaken by the Environment Agency, Natural England and Ofwat to assess the impact of housing growth on water in the proposed Growth Points.

3. A number of towns and cities that are keen to pursue higher rates of growth have submitted bids to DCLG to become 'Growth Points'. The DCLG will announce in October which bids will receive a share of an initial £40 million pilot funding round to support site infrastructure projects (DCLG, 2006b).

Contribution to tackling water affordability

Rising utility bills will always attract public concern. Average household water bills are expected to rise by 18 per cent in real terms over the period 2004-05 to 2009-10, and will have risen by around 7 per cent from 1999-2000 to 2009-10 (Ofwat, 2004a). The national average household bill will be £295 (before inflation) in 2009-10 but this masks a significant range between companies (Figure 2.4). Customers of South West Water will pay the most with an average of £444 by 2009-10, while customers of Northumbrian Water will pay the least with an average of £260.

Figure 2.4 Water and sewerage bills (before inflation) in 2005-05 and 2009-10



Source: Ofwat (2004a)

Water affordability is a growing concern and was one of Defra's original sustainability indicators. There is currently no consensus as to how water affordability should be defined, measured or calibrated (Sawkins and Dickie, 2005). This is in contrast to fuel-related poverty, where a benchmark has been developed. The water affordability indicator that the Government used (for illustrative purposes) was that customers should spend no more than 3 per cent of household income on water and sewerage bills (HM Government, 2004). A cross-Government review of water affordability found that lower income customers were more likely to spend a higher proportion of their income on water and sewerage bills than higher income customers (Defra, 2004a). Some households spend up to 9 per cent of their income on water bills. But the proportion of households spending more than 3 per cent of their income on water charges fell from 15 per cent in 1999-2000 to 9 per cent in 2002-03 (HM Government, 2004).

The problem of water affordability can be linked to rising levels of consumer debt. Water customers cannot be disconnected for non-payment of water bills and cannot pay via a pre-payment meter for reasons of sanitation. Poor families on low incomes are most likely to default, but there is also a significant proportion of debtors who are considered as 'able to pay' (UKWIR, 2004). The cost per customer of debt for some companies is just under £10 (HoL Select Committee on Science and Technology, 2006).

Defra is funding a pilot study in the South West to determine how to target water affordability assistance. Among other measures, it will look at the contribution of targeting demand management assistance (including metering and retrofitting domestic water efficiency measures) to those who may benefit most. The results of the pilot will be available in 2007.

Energy savings and other environmental benefits

The process of abstracting, transporting, and treating water uses energy and thus produces carbon emissions. On average, 1ML of water requires 468kWh to supply, producing 209kg of CO₂, while 1ML of wastewater requires 437kWh to treat, producing 195kg of CO₂ (BRE, 2004). These values will vary depending on the source of water and the amount of pumping and treatment involved.

Our calculations suggest that a 10 per cent reduction in total household water demand could result in carbon savings of 126 tonnes per day or 45,990 tonnes per year. This does not include energy savings from a reduction in hot water use within the home. To put this into perspective, this level of saving could contribute around 0.3 per cent towards the UK's domestic target to cut carbon emissions by 20 per cent by 2010. It is, however, expected that energy usage in the water industry will increase in the future as a result of more strenuous water quality treatments and rising demand leading to increased pumping of water between resource zones and the development of energy intensive desalination plants (Yorkshire Water, 2005). Some water companies are already undertaking energy efficiency programmes to mitigate against these future pressures.

Improving water efficiency may bring other environmental benefits. Rainwater harvesting can contribute to flood alleviation in certain locations. In Germany the installation of rainwater harvesting systems is supported by a number of municipalities as a flood management measure and the industry has an annual turnover of 340 million euros (Umwelt Magazin, 2006).

The potential for improving household water efficiency

There is significant potential for increasing overall water savings in the existing building stock. There are currently 21 million homes in the UK; 3.5 million of these are in the water-stressed South East Government Office region. However, the evidence base on the current water efficiency of these existing homes is somewhat limited and most is scattered across water companies. Product sale information, if it were more widely available, could give an indication of how many domestic water products are being sold, helping to build a picture of consumer trends (for example, towards or away from using water-efficient goods).

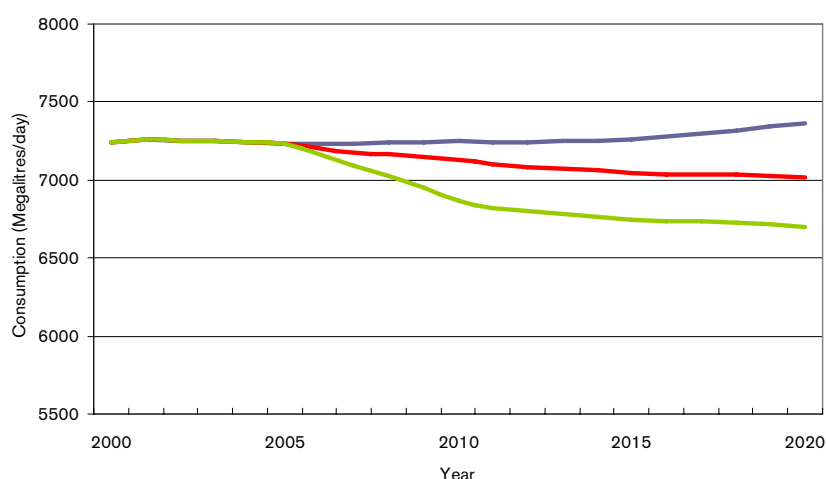
Households can use less water by adopting water efficiency and water conservation measures and all types of home can become more water efficient through a relatively small range of measures (for example, water-efficient WCs, taps, showers, water butts). However, the choice and performance of specific water efficiency measures can be impacted on by water hardness and variable water pressure in different areas.

Estimations vary as to what water savings are possible, mainly because of the influencing factor of individual behaviour. The Sustainable Development Commission estimates a 30 per cent reduction is achievable in the average existing home through minimisation of demand and retrofitting of more efficient water-using appliances (SDC, 2006), while the Environment Agency suggests households could reduce their consumption by 14 per cent (49.3 l/day) via retrofit only (Environment Agency, 2006, forthcoming). A trial by Essex and Suffolk Water estimated that water savings associated with a water audit and the provision of simple retrofit measures and internal leak detection and repair were between 7 and 11 per cent. The Market Transformation Programme (MTP) identified a technical savings potential of 12 per cent, with further savings achievable through water metering (MTP, 2006).

Most savings would be found through improving the efficiency of WCs, tapware and showers (ibid). Newly developing technologies, such as ultra-efficient 1.5l WCs, may lead to further savings being identified in the future. MTP's scenarios suggest that by 2020, policies to encourage take-up of more sustainable products could help reduce total household demand quite significantly (Figure 2.5). With moderate take-up (based on metered households), the Environment Agency estimated that a package of five retrofit measures could, over five years, save 103Ml/day across England and Wales. Higher take-up could save up to 382.7Ml/day (Environment Agency, 2006, forthcoming).

The Environment Agency considered the economics of its measures in terms of pay-back periods and factored in DIY or professional installation costs and installation as part of a large-scale implementation programme. Based on an average water and sewerage bill of £295, the pay-back period was between 22 and 26 months, and metered households could save an average of £34.60 to £41 a year (for an undetermined period of time) (ibid). There was no consideration of the lifetime of the measures. An economic assessment using pay-back periods, while relatively simple for consumers to understand, is not useful for water company planning as it does not factor in maintenance or replacement considerations. UK Water Industry Research (UKWIR) is currently examining water efficiency projects to assess them on the basis of cost-effectiveness and sustainability, to develop estimates of long-run marginal costs so as to more easily compare them with leakage and supply-side options (see chapters 3 and 4).

Figure 2.5 Scenarios for household water use 2000–2020



Key

Reference (Ref): what is expected to happen without new policy intervention.

Policy (Pol): this estimates what could be achieved through an ambitious, but feasible programme of critically timed policy measures and other logistical actions.

Earliest Best Practice (EBP): a projection of what would happen if everyone started buying the best available products, manufacturers put the best technologies on the market in a fairly rapid timescale, and the Government took all reasonable (but ambitious) policy steps to mitigate adverse environmental impacts.

Source: MTP (2006), courtesy of the Market Transformation Programme www.mtprog.com

Summary of findings

- Improving the water efficiency of the building stock could contribute to a secure and sustainable water future, to tackling water affordability and to reducing carbon emissions and, in some areas, flood risk.
- The areas of unsustainable or unacceptable abstraction of water are concentrated in the Greater South East. Yet, on average, people in this region consume significantly more water per person than in other parts of England and Wales.
- All UK regions are predicted to face an increase in the frequency of droughts as a result of climate change, with the South East and South West to be most affected. Adaptation measures will be needed, particularly in areas with high development pressures.
- Per capita consumption of water has remained reasonably steady for a decade. Predicting future trends in consumption is difficult but it is likely that, unless there is a radical shift, there will be significant increases in unmeasured water consumption.
- The Government, the regional assemblies, Ofwat, the Environment Agency and the water companies should do further work to better understand and communicate the potential impacts on total water demand of building additional homes in response to the Barker Review.
- Targeting improvements in household water efficiency to low income and vulnerable households could reduce individual water bills, contributing to improving affordability and helping to stem the rise in non-payment of water bills.
- Reducing water consumption in all homes by an average of 10 per cent could lead to a small, but not insignificant, reduction in energy use and related carbon emissions.
- Rainwater harvesting has the potential to contribute to flood alleviation in some areas.
- All types of home can become more water efficient through a relatively small range of measures. Most savings would be found through improving the efficiency of WCs, tapware and showers.
- Estimates of the potential for water savings in the existing housing stock vary from 12 per cent to 30 per cent, depending on whether the influence of metering and behaviour change are included.
- The pay-back period for a package of five retrofit measures is estimated as between 22 and 26 months, and metered households could save on average £34.60 to £41 a year. Further work is needed to evaluate the cost-effectiveness of measures, which takes account of lifetime costs.

3. The twin-track approach to balancing supply and demand

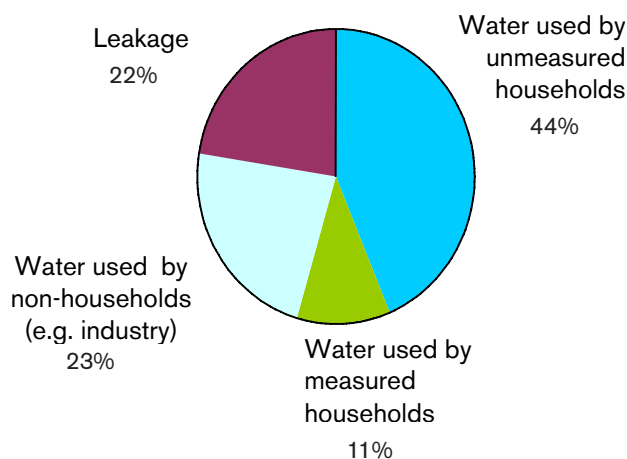
As a shared but limited resource, people, businesses and the Government have a collective responsibility to use water wisely and ensure its consumption and production remain within environmental limits. As most households receive their water from a water company via the public water supply, water companies are perhaps the most well placed to directly influence household water use.

In England and Wales water companies are expected to meet the water supply-demand balance by following the 'twin-track' approach. For the Environment Agency this means selecting new resource developments only where a demand management approach is clearly insufficient or unjustified in terms of cost, public acceptance or sustainability. Ofwat expects companies to take the most cost-effective route to meeting its water needs, taking account of environmental and social costs – the 'economics of balancing supply and demand' (EBSA). Arguably, for some, both of these approaches encourage an 'either/or' selection of demand management or supply-side options and so neither could be considered to fully embrace the commonly held notion of a twin-track approach whereby supply and demand measures are pursued together. Company plans were criticised by the Environment Agency in the 2004 periodic review for being biased towards supply-side measures (Environment Agency, 2004).

There are three reasons why the demand management track has become more of a broken rail:

- The regulatory system currently rewards supply expansion – with profits made by selling more water (and treating more sewage) and from returns on capital assets. Such returns are not available for the majority of demand management measures. In the absence of regulation, monopoly water suppliers have little incentive to introduce or make the case for demand management measures unless there are no, or only very expensive, supply-side options available.
- It can be difficult to quantify water savings from water efficiency measures both in the immediate and longer term, and unit costs can be highly variable across different areas. The periodic review process has not enabled effective funding to develop the evidence base required for companies to prove or dispel the case. Funding is generally given to low-cost or low-risk water efficiency options (see chapter 4).
- The economic case for (or against) demand management measures, particularly the promotion of water efficiency, is thus often difficult to make by water companies. Further, some water companies make a poor economic case partly due to confusion over social and financial costs, under-reporting of externalities and the use of outdated means of economic appraisal such as pay-back periods. Not all of the wider benefits of demand management measures can be captured by water companies.

Figure 3.1 Components of public water supply (2004-05)



Source: Ofwat (2005)

Leakage is the only area of water use (Figure 3.1) that is subject to any form of mandatory target. Demand from the other sectors is unregulated, although companies have to ensure overall security of supply and are assessed against a Security of Supply Index (SoSI).

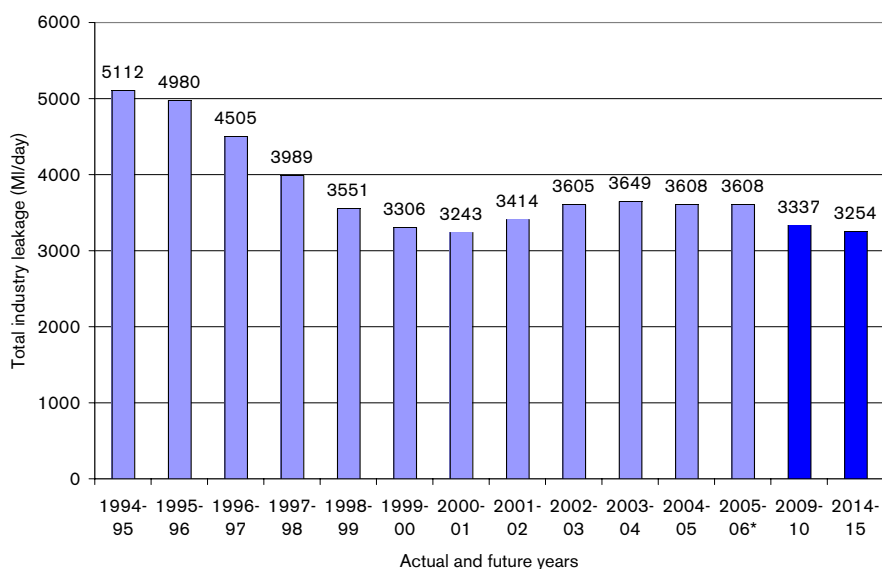
Tackling leakage

Since the Government's Water Summit in May 1997, water companies have been set mandatory leakage targets by Ofwat. These targets are now based on the 'economic level of leakage' (ELL). This is the level at which leakage repair or renewal becomes more expensive than meeting the supply-demand balance through other means, taking account of environmental and social costs as well as financial ones. Since April 2005, Ofwat can fine water companies up to 10 per cent of their turnover for failing against levels of service, including failure to meet leakage targets, though that power has yet to be used. There is some dispute over whether the ELL pays sufficient attention to environmental stresses and needs (HoL Science and Technology Committee, 2006). Ofwat recently announced a joint review of the ELL that among other things will look at how to fully incorporate sustainability issues and how best to take account of environmental and social costs (Ofwat, 2006d).

Leakage targets cover mains and supply pipe leakage. Water companies are responsible for the mains and pipes leading to their stop tap, typically at the boundary of a property. Householders are responsible for the supply pipe that takes water from the stop tap into the house. Supply pipe leakage accounts for about 30 per cent of total leakage and all companies offer incentives to customers to encourage leakage repair or renewal.

Leakage issues have generated much media interest particularly following the announcement that four water companies – Thames Water, Severn Trent, United Utilities and Southern Water – failed to meet their 2005-06 leakage targets (Ofwat, 2006a). Thames Water drew the most ire as it has a much higher level of leakage than any other company, is the furthest from meeting its 2009-10 leakage target and last met its leakage target in 1999-2000 (Ofwat, 2006e). It also currently has a hosepipe ban in place and applied for a drought order in 2006, which it recently withdrew due to the stabilising of the water resource situation.

Figure 3.2. Industry – total leakage (MI/d) – actual and future targets



Source: Ofwat (2005, 2006a) Note: *The figures for 2005-6 reflect a methodological change by Severn Trent Water, which if consistent with the previous year would indicate a reduction in leakage of 20ML/d

The popular perception is that water companies are not doing enough to reduce leakage and/or that leakage targets are not tough enough. Most companies are meeting or exceeding their targets. Because targets are based on the economic level of leakage, if companies were to exceed their targets this would not be cost-effective. Leakage levels fell by around 20MI/day in 2005-06, which is not a huge amount. Nonetheless, leakage targets appear to have worked to drive down leakage over time (Figure 3.1). In 2005-06, overall leakage in England and Wales was down to around 3600MI/day from nearly 5000MI/day a decade earlier (Ofwat, 2006a).

If Ofwat is to restore public confidence in its ability to regulate leakage targets, it must be seen to be taking a much tougher approach with companies that successively fail their targets, and to act sooner rather than later where companies are missing targets by a significant margin. Ofwat decided not to fine Thames Water for breaching its leakage target for 2005-06 on the basis that the money would have gone to the Exchequer and not to the benefit of customers. Instead it secured a legally binding agreement with Thames Water that it would spend an extra £150 million replacing leaking water mains at the expense of its shareholders (Ofwat, 2006e).

Promoting water saving

Leakage reduction is a widely accepted form of demand management, but the two other key forms – metering and promoting water saving by customers – rely much more on the consumer. These and the development of non-potable supplies for low-quality water demands are underdeveloped in the UK.

In 2005 Defra formed the Water Saving Group consisting of Defra, DCLG, Ofwat, the Environment Agency, CC Water, Water UK and Waterwise⁴, fulfilling a Government manifesto commitment to create a water saving body. The Water Saving Group is concerned with developing options for encouraging households to reduce consumption and use water more efficiently. It has developed an action plan for taking forward its work, which includes: understanding customer perceptions and awareness; best practice in promoting water efficiency; measuring success, information gaps, priorities and funding for water efficiency; and improving the policy and regulatory framework.

Summary of findings

- Water companies are expected to meet the water supply-demand balance by following the twin-track approach.
- The regulatory system currently rewards supply expansion – with profits made by selling more water (and treating more sewerage) and from returns on capital assets. Such returns are not available for the majority of demand management measures.
- It can be difficult to quantify water savings from water efficiency measures, both in the immediate and longer term. The periodic review process has not enabled effective funding to develop the evidence base required for companies to prove or dispel the case for such measures.
- The economic case for (or against) demand management measures, particularly the promotion of water efficiency, is thus often difficult to make by water companies.
- Water companies are set mandatory leakage targets by Ofwat based on the ‘economic level of leakage’ (ELL).
- The popular perception is that water companies are not doing enough to reduce leakage. In fact, most companies are meeting their leakage targets. Overall leakage has reduced by around 1400MI/day over the course of the last ten years.
- If Ofwat is to restore public confidence in its ability to regulate leakage targets then it will need to be seen to be taking a tougher approach with companies that successively fail their leakage targets, and to act sooner rather than later where companies miss targets by a significant margin.
- Leakage reduction is a widely accepted form of demand management, but the two other key forms – metering and promoting water saving by customers – rely much more on the consumer and are undeveloped in the UK.
- The Government has established a Water Saving Group to develop options for encouraging households to reduce consumption and use water more efficiently.

4. Waterwise is a new independent NGO, set up in 2005 with a five year lifespan. It has support from the water industry, and has the specific aim of decreasing water consumption in the UK within five years. It is also developing a research programme.

4. Improving domestic water efficiency

The Water Act 2003 placed water conservation duties on water companies, public bodies and the Government (see appendix 1). This chapter considers the extent to which these duties have been interpreted and taken forward. Metering is considered separately in chapter 5.

Water companies

Duties on companies

The Water Act 1991 was amended in 1996 to include a duty on companies to promote the efficient use of water by their customers. This was upgraded in the Water Act 2003 by an additional duty to further water conservation. Defra was due to provide guidance on the new duty last year, but this has been delayed until the Autumn 2006. Ofwat expects a 'basic minimum level of activity from all companies, unless supplies are under pressure where a more active approach is necessary' (Ofwat, 2005).

Ofwat assesses performance against the duty to promote efficient use using four criteria⁵ (Ofwat, 2005), but does not provide specific quantified guidance on what a basic level of activity or what a more active approach may involve. Nor has it provided clear guidance on how companies should develop water efficiency project proposals and calculate cost-effectiveness, although UKWIR is addressing this. In the 2004 Periodic Review only six of the thirteen companies who put forward proposals for water efficiency projects, as part of measures to meet the supply-demand balance, received additional funding (for seven projects). Projects were refused because they were poorly defined, did not realise clear and quantifiable water savings, did not constitute service enhancement or did not demonstrate associated improvements to the company's supply-demand balance position (Ofwat, 2004a).

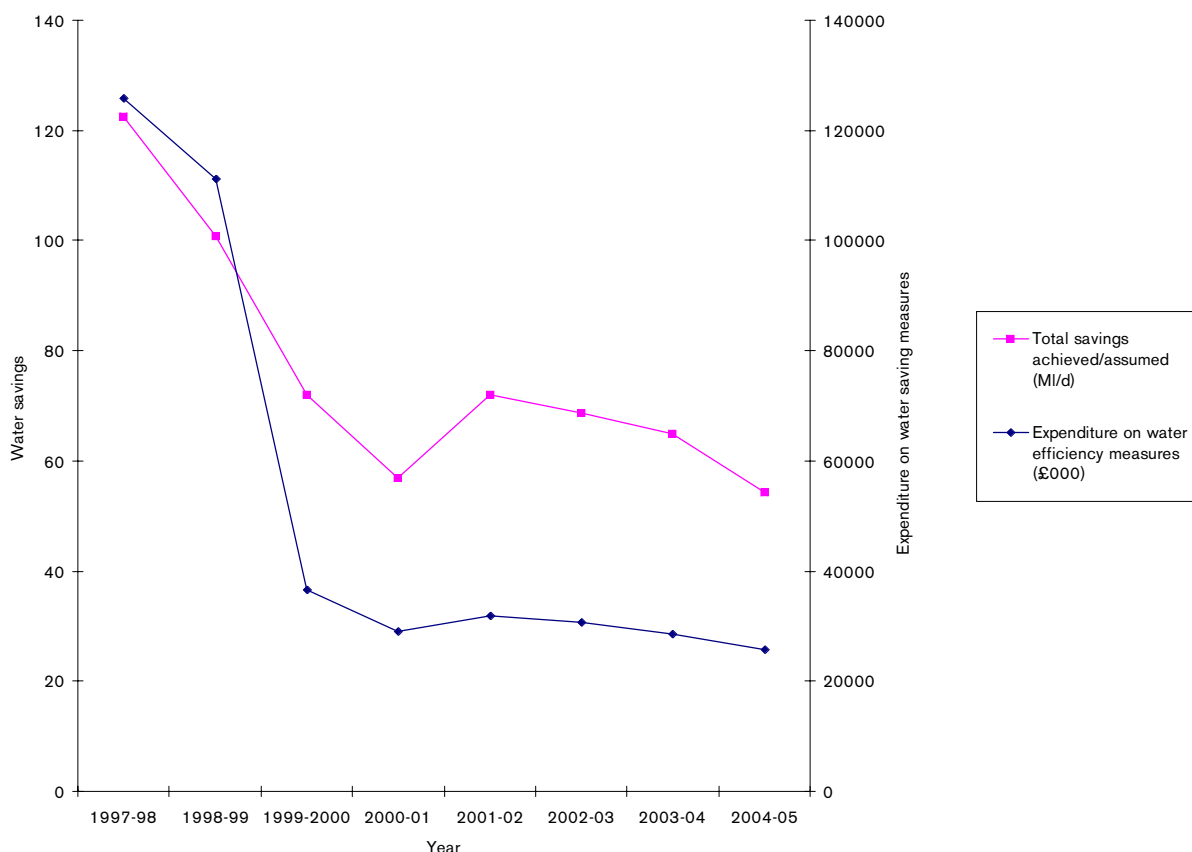
Ofwat expects companies' general water efficiency activity to be financed as part of base service provision. But the need to make annual efficiency savings means that this aspect of (non-ring fenced) activity is often one of the first to feel the fiscal squeeze. The result is that most companies (with exceptions) do a minimum level of activity, often entailing cheap, as opposed to cost-effective, measures, which deliver small and transient savings (Howarth, 2006). Such savings typically serve to smooth out the cost curve: that is, they temporarily ensure the supply-demand balance is met before costs get too high, before a new resource is brought online (Bakker, 2003).

Water efficiency measures

What is classified as 'water efficiency' activity for the purposes of annual reporting is somewhat open to interpretation. Currently, supply pipe leakage activity is recorded alongside 'water efficiency' activity. Of the water efficiency measures undertaken by companies, cistern displacement devices (CDDs) and water audits (which are reported to Ofwat individually) form a significant, albeit declining, part of activity. However, they do not score as well, in terms of cost efficiency and sustainability, as measures such as dual- and low-flush WC retrofits or rainwater harvesting (Pocock, 2005). All companies, to some degree undertake other water efficiency activity such as campaigns, educational activities, research, partnerships with other organisations, incentive and retrofit schemes (Water UK, 2004). Many activities by water companies are concentrated on communities, schools and particular areas, so as to impact on a large number of people and enabling a cost-effective means of information spreading. Water savings are not always attributed to these different activities, or, if they are, are given with low confidence levels, so water companies are unable to fully rely on them. The effectiveness of schemes that target individual households has been mixed, with some companies recording very low levels of take-up. This may be due to inappropriate and/or unimaginative marketing as well as some customer apathy.

5. The presence of an efficient pricing framework and a long-term education programme, the cost-efficiency of activities and the targeting of promotion at customers who would benefit most.

Figure 4.1. Total water savings (MI/d) compared to total expenditure on water efficiency (including supply pipe leakage) 1997-98 to 2004-05 in England and Wales (adjusted for inflation)



Source: Ofwat (2005)

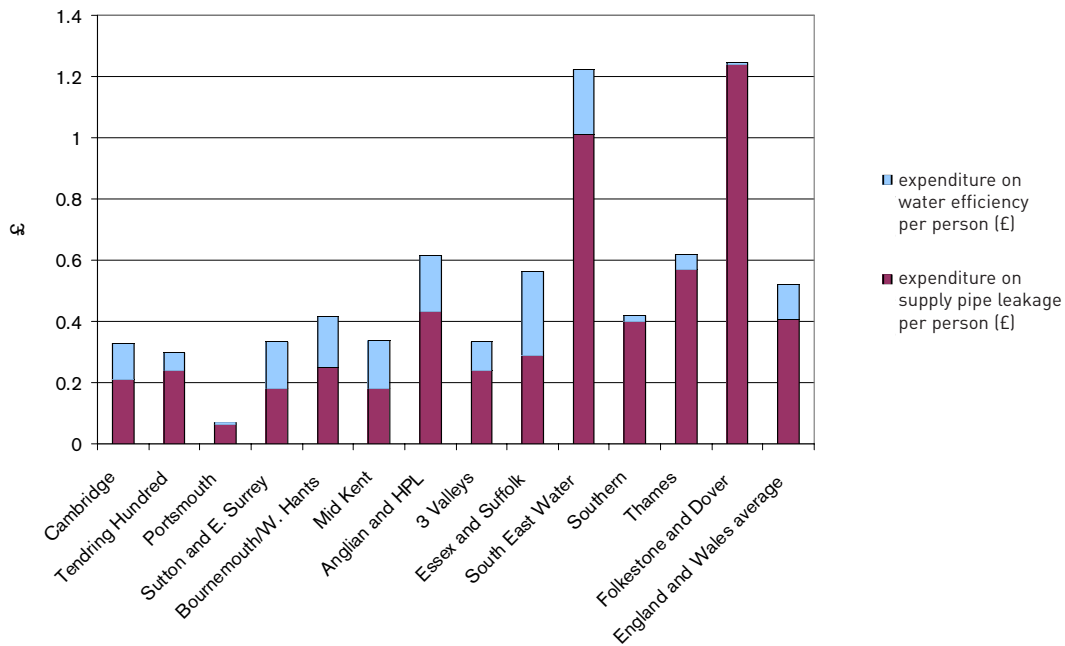
Company activity under the duties

Figure 4.1 shows that total expenditure and attributable water savings due to water efficiency (including supply pipe leakage repair) have declined from a (drought influenced) peak in the mid-1990s. There is no discernible rise in water savings or expenditure in 2004-05 – the start of the current drought. While changes in reporting requirements and yearly variation may explain some aspects of the trend, and attributable water savings figures should be treated with caution, these figures support the view that the duties placed on companies have had little, if any, positive effect on company activity on water efficiency.

Addressing supply pipe leakage is an essential demand management activity. However, including supply pipe leakage under the reporting of annual water efficiency activity distorts what companies are doing under the duty as companies are set mandatory leakage targets. Figure 4.2 shows that companies in the Greater South East spent proportionately more on supply pipe leakage than other water efficiency measures. As a group, these companies achieved an annual average of 36MI/day water savings from supply pipe leakage and 4.6MI/day from water efficiency between 2002/03 and 2004/05. This compares to a national annual average (across England and Wales) of 46.8 MI/day saved through supply pipe leakage and 15.6 MI/day from water efficiency activity during the same period (see Appendix 2).

Table 4.1 compares how much companies spent to achieve 1MI/day from supply pipe leakage reduction and from water efficiency measures. This is a crude analysis, and for many companies their water efficiency activity includes research, regulation inspections and customer leaflets, activities for which achieving direct water savings are not a primary aim. Such activities increase the cost of achieving 1MI/day from water efficiency calculated in Appendix 2.

Figure 4.2 Comparison of average annual expenditure on water efficiency and supply pipe leakage on a per person basis (2002-05)



Source: Sources: Ofwat 2005, Ofwat 1992-93 to 2004-05. See Appendices 2a and b for further notes

Table 4.1 Company rankings based on Security of Supply Index (SoSI) – Comparing water efficiency and supply pipe leakage activity on the basis of average annual expenditure (£k) per MI/day of water saved 2002-03 to 2004-05

Company	Security of supply status*	Water efficiency expenditure ¹ (£k) per MI/d saved ²	Supply pipe leakage expenditure (£k) per MI/d saved ²
Cambridge	AAA	420	608
Tendring Hundred	AAA	380	3,588
Portsmouth	AAA	299	474
Sutton and East Surrey	AAA	n/a	1,670
Bournemouth/West Hants ³	AAA	577	460
Mid Kent ³	BBB	119	178
Anglian and Hartlepool Water (HPL)	BBB	647	497
3 Valleys	CBB	42,275	898
Essex and Suffolk	BCB	1,306	467
South East Water ³	DCB	625	3,267
Southern	CDC	152	134
Thames	DDD	330	209
Folkestone and Dover	DDD	100	2,466

Notes:* Security of supply index (2002-03, 2003-04, 2004-05): A: No deficit against target headroom in any resource zone; B: Marginal deficit against target headroom; C: Significant deficit against target headroom; D: Large deficit against target headroom.

See Appendices 2a and b for further notes

Source: Ofwat (2005), Ofwat (1992-93 to 2004-05)

It is little surprise that these figures indicate that for most companies it is cheaper to save 1Ml of water through leakage reduction than through water efficiency. Four companies in the Greater South East are the exceptions, with Folkestone and Dover and South East Water the most notable of these. Both companies are ranked D ('large deficit against target headroom') for all or part of the three year period reviewed, and despite there being a seemingly clear economic case, both have undertaken comparatively small amounts of water efficiency activity (see Figure 4.2). Attention was drawn to this apparent anomaly by auditors:

'...simple measures [such as] cistern devices, water audits and subsidised water butts/hose guns are more cost-effective than leakage control or water regulations by orders of magnitude....and arguably effort [in this area]should be increased' (Auditor report for South East Water (Ofwat, 1992-3 to 2004-5)).

It may be that these companies have included costs in their leakage accounts that other companies have not – which may push up the unit cost of 1Ml saved through supply pipe leakage control. Cambridge and Tendring Hundred's figures also indicate it may be more cost-effective to do more on water efficiency than leakage, but these companies have high rates of metering (54 per cent and 61 per cent respectively) and relatively low per capita consumption (148 l/p/d and 125 l/p/d respectively) (Ofwat, 2005).

Comparing Figure 4.2 with the company Security of Supply Index (SoSI) rankings, shows that companies in the Greater South East, ranked as having greater security-of-supply issues (C or D), generally spent more on water efficiency and supply pipe leakage renewal/repair (combined) annually over the last three years than companies ranked A or B. This is in line with Ofwat's expectations under the duty.

But as Table 4.2 shows, when expenditure on water efficiency is scrutinised, the pattern is not so clear. During the period between 2002 and 2005, Thames Water and Folkestone and Dover Water Services (both consistently ranked D in terms of security of supply and considered to be in areas of water shortage) spent 5p and seven-tenths of a penny per person each year on water efficiency respectively.⁶ The average spend by water companies in the Greater South East on water efficiency was 11.5p per person per year, and for supply pipe leakage repair it was 41p. This was only marginally above the England and Wales average of 10.5p for water efficiency and 40.4p on supply pipe leakage (see Appendices 2a and 2b).

In terms of the actual water savings achieved, the pattern is more mixed still. In an average year companies across the Greater South East saved just over a quarter of a litre per day per person through water efficiency measures. This equates to a mug of water. The greatest savings were achieved by Mid Kent Water (consistently ranked B), which attributed savings of 1.3 litres per day per person (equivalent to four cans of soda or just over five mugs of water), while Thames and Folkestone and Dover achieved savings well below the regional average. Somewhat surprisingly, given the water-stressed state of the region, the Greater South East average annual water saving of 250mls per person is lower than the England and Wales average, where water companies managed to save 327mls per person through water efficiency measures.

These findings offer several conclusions. The reporting requirements for water efficiency are currently too open in certain respects, with companies showing considerable variation in what they include as water efficiency activity and to some extent supply pipe leakage activity. There seems to be little consensus on the methodology to calculate water efficiency savings. This makes it difficult to compare performance across companies. Ofwat needs to issue clear guidance to water companies on what should be included (or excluded) under water efficiency activity and expenditure in their June returns.

Although supply pipe leakage control is a vital demand management measure, it should be separated from other water efficiency activity both in terms of water savings and expenditure in Ofwat's annual reporting of company activity. This is because supply pipe leakage activity qualifies as helping to meet mandatory leakage targets. Companies can currently meet both the leakage target and the duty to further water conservation by concentrating only on supply pipe leakage activity, as Folkestone and Dover has done. Similarly, research and development activity, regulatory activity (inspections) and perhaps short- (drought) and long-term household water efficiency measures should be isolated or clearly identified in company returns and Ofwat's annual reporting. This will make it easier to scrutinise company performance on the duty to further water conservation and allow for a clearer assessment on the relative cost efficiencies of household water efficiency measures compared to leakage and other demand- or supply-side measures. It

6. Although Folkestone and Dover had the highest spend on supply pipe leakage on a per-person basis out of all the water companies in England and Wales.

Table 4.2 Company rankings on security of supply – comparing expenditure per person and average annual savings (l/day) per person achieved through water efficiency measures 2002-03 to 2004-05

Company	Security of supply status*	Water efficiency expenditure ¹ per person	Average annual savings ² per person (l/d)
Cambridge	AAA	0.119	0.284
Tending Hundred	AAA	0.059	0.155
Portsmouth	AAA	0.008	0.026
Sutton and East Surrey	AAA	0.153	0
Bournemouth/West Hants ³	AAA	0.165	0.285
Mid Kent ³	BBB	0.157	1.324
Anglian and Hartlepool Water (HPL)	BBB	0.184	0.284
3 Valleys	CBB	0.095	0.002
Essex and Suffolk	BCB	0.273	0.209
South East Water ³	DCB	0.213	0.341
Southern ³	CDC	0.018	0.12
Thames	DDD	0.05	0.156
Folkestone and Dover	DDD	0.007	0.069
Greater SE AVERAGE		0.115	0.250
England and Wales AVERAGE		0.105	0.327

Notes: *Security of supply index (2002-03, 2003-04, 2004-05): A: No deficit against target headroom in any resource zone; B: Marginal deficit against target headroom; C: Significant deficit against target headroom; D: Large deficit against target headroom.

See Appendices 2a and b for further notes

Source: Ofwat 2005, Ofwat 1992-93 to 2004-05

would also be helpful to include or reference information on metering alongside information on water efficiency, as some companies currently do already.

The current duty on water companies to promote water efficiency and further conservation by its customers is not ensuring that companies, even in the more water-stressed areas, are delivering more water savings at the household level. If the Government is relying on the duty as a key policy driver for helping domestic consumers to be more water efficient, particularly over the longer term rather than at times of drought, then it needs to rethink the duty and how it is interpreted by both Ofwat and the companies. Ofwat should also consider how it can incentivise companies to do more on water efficiency, particularly if the cost-effectiveness and sustainability case is clear (compared to other supply- or demand-side options). Assuming that economics will drive water efficiency activity may be over-optimistic as economics did not drive leakage reduction before targets were introduced.

Public authorities

Under the Water Act (2003) public authorities have a duty 'to take into account, where relevant, the desirability of conserving water supplied or to be supplied to premises' (HMSO, 2003). This applies to both their actual use of water (see Box 4.1) and where their functions might have an impact on water use. The Local Government Association has provided guidance on how local authorities can create sustainable communities (LGA and Defra, 2006) and what water management may involve for local authorities (LGA, 2005). Local authorities (and other public bodies) have a role in demonstrating leadership and using and promoting good practice.

Box 4.1 'Woking Borough Council has implemented a range of water conservation and efficiency measures in its own buildings, including cistern dams, tap regulators, flow controls, waterless urinals, water recycling, leak detection. This led to a reduction in its water consumption by 43.3 per cent between 1991 and 2000 and a financial saving of 11.3 per cent.' (Defra, 2006a: 21)

The response by public authorities to the Water Act has so far been mixed, as guidance is still to be issued. The degree of action is influenced by the state of local water stress and the impact that stress may have on development and the community. For example, Hampshire and Kent County Councils have developed initiatives on water management and water efficiency in response to the pressures on water resources within their areas (HCC, 2003; KCC, 2005). In London, the Mayor has shown a growing interest in water management (GLA, 2006). As part of the recently announced expansion of Mayoral powers, the Greater London Authority's Water Action Framework will be taken into consideration by the Secretary of State when working with regulators to cap water prices.

Local authorities and other public bodies are well placed to work with water companies and other stakeholders to deliver water savings. Public bodies may be regarded with more trust by the public than water companies and could play a useful role promoting water efficiency, as many currently do with energy efficiency. However, unlike in the energy sector, there is no co-ordinating body to provide advice and information and facilitate the matching of (water company and other) funding with potential projects. Opportunities are being missed to include water efficiency as part of a package of measures in the upgrading of social housing.

Local authorities could consider making water conservation a material consideration in Local Development Frameworks and produce supplementary planning guidance to encourage sustainable water-saving homes. Where appropriate, they could also identify and prioritise water issues in Local Area Agreements, (Sustainable) Community Strategies and Local Strategic Partnerships. Local authorities could provide information to developers, homeowners and tenants on how they may be able to improve the water efficiency of homes (see KCC, 2005; Woking LA21 Group, 2005) and where relevant, what incentives companies may offer to ensure more water-efficient homes, such as reduced infrastructure charges to developers (e.g. South Staffordshire Water, 2000). Ofwat is currently looking at the role of infrastructure charges in incentivising water efficiency as part of its workstream for the Water Saving Group.

The power of 'well-being' – which entitles local authorities to do anything that might achieve the promotion or improvement of the economic, social or environmental well-being of their area (LGA, 2003) – could provide a means of taking water efficiency initiatives forward at a local level. In areas where water issues are identified as a priority, this power could help support a range of initiatives to help improve the water efficiency of homes and buildings.

Government – policies and initiatives on domestic water efficiency

The Water Act 2003 stipulates that the relevant authority (Secretary of State, in relation to England or the Assembly, in relation to Wales) has a duty to take steps to encourage the conservation of water. DCLG, the Department for Trade and Industry (DTI) and HM Treasury all have a role with regard to encouraging water efficiency, but primary responsibility lies with Defra. As well as the Water Saving Group (see chapter 3), the Government has cross-cutting agendas such as sustainable consumption, innovation and market transformation in environmental technologies and sustainable procurement that have applications to water. Below we focus mainly on what the Government is doing to encourage the efficiency and conservation of water by households, and to a lesser extent businesses. Metering is not included, but discussed in the following chapter.

Improving homes

The *Water Supply (Water Fittings) Regulations 1999* were introduced to prevent contamination, waste and undue consumption and include some specifications for water use standards of fittings and appliances. The regulation aims to prevent undue consumption by preventing the installation of the least efficient products from the market. Minimum standards have been set for the water consumption of WCs, washing machines, dishwashers and washer driers. The regulations' major weakness is that enforcement is only possible at the point of installation, not at the point of sale or manufacture. Changing enforcement to the point of sale or manufacture may be more effective.

Under the regulations water companies are required to be informed if certain high-water-use appliances or commodities, such as swimming pools, are installed in premises, so that companies can use their discretionary powers to meter them. This measure has not been very effective, as householders and installers have no incentive to notify water companies and it is often not cost effective for water companies to meter homes on this basis. The Government should explore with water companies, installers, manufacturers and retailers how to improve the notification process and whether high-water-use appliances or commodities should come with a 'warning label' that companies could meter on the basis of ownership of the product.

Water efficiency is not currently included in building regulations. The only measure the Government has committed to is proposing making the fitting of dual-flush or low-flush WCs standard (HMT and ODPM, 2005). A consultation on proposals for the introduction of regulations to require water efficiency within buildings is expected this year. Improving the efficiency of WCs would, it is argued, deliver a 10 per cent reduction of average household consumption, but as many new WCs are already dual flush (MTP, 2005), the impact may not be that great. The advantage of the water fittings regulations over building regulations is that the former will impact on both new and existing homes. However, unless there are modifications in enforcement, a greater impact may be felt by amending building regulations. This would be enhanced if the reach of building regulations were increased to include all major refurbishments (see SDC, 2006).

The draft voluntary *Code for Sustainable Homes* (CSH) includes water efficiency as one of six essential elements. Any Code-compliant home must meet a minimum standard of water efficiency, currently proposed as 125 litres per head per day (ODPM, 2005b). Since the consultation, ODPM/DCLG has announced that minimum standards of water (and energy) efficiency will apply at every Code level (ODPM, 2006b). All homes receiving direct government funding through English Partnerships and Housing Corporation programmes will have to meet level three (of five) of the Code. ODPM also stated that the Code will form the basis for the next wave of improvements to building regulations (ODPM, 2006b) (or, depending on the consultation outcome, water fittings regulations).

The CSH will not directly affect the bulk of the existing building stock. There are calls for all homes to be assessed against the CSH and for this information to be included in Home Information Packs (HIPs) (SDC, 2006). DCLG's recent announcement to reconsider the place of Home Condition Reports in HIPs suggests this is unlikely to happen (DCLG, 2006c). Even if it were, the relative cheapness of water and low rates of metering may mean that water efficiency is still overlooked in favour of energy measures, unless some form of fiscal incentive is made available. In the social sector, a voluntary environmental efficiency assessment for existing homes (Ecohomes XB) has been launched, which with some further development on the water measures in particular, has the potential to help drive environmental improvements across the four million homes owned and managed by housing associations and local authorities in England (Housing Corporation, 2006).

Encouraging behaviour change

The Government's Sustainable Development Strategy stresses the need to engage, encourage and enable people and communities in the move towards sustainability and that government must lead by example. It recognises that regulation only goes so far and that there is a major role for encouraging sustainable behaviour but that it must be built upon effective engagement with the public (HMG, 2005; SDC, 2006). Despite a growing interest in how to change behaviour towards sustainable consumption, relatively few studies consider water. There are two principle areas of behaviour that policy could seek to influence: purchasing behaviour, and water-using, or routine behaviour. The state of knowledge on both is currently quite low and untested (Medd and Shove, 2005). The Consumer Council for Water is leading work on engaging with water customers, due in late 2006, and this should help inform future policies on consumer attitudes, priorities and disposition to water-saving behaviour.

Purchasing behaviour

The current market for water-efficient goods and services is very limited, due in part to a lack of easily accessible product information. Take-up of new innovations may also be hampered by the long approval process of the Water Regulations Advisory Scheme (WRAS). Without market certainty, manufacturers have little incentive to invest in innovation and retailers have little incentive to market water-efficient products. The energy efficiency labelling scheme has helped transform the market for energy-efficient goods and in the case of boilers this facilitated the mandating of more energy-efficient gas condensing boilers.

Defra is looking at the feasibility of developing a voluntary water information labelling scheme for domestic products. If adopted by manufacturers and retailers, the label could be instrumental in influencing purchasing behaviour and transforming the market for water-efficient goods. For harder-to-reach consumers, particularly those not on a meter, there may be a need to introduce a fiscal incentive (Dresner *et al*, 2006). In addition, Defra is planning to launch Environment Direct in late 2006, a new information resource on the environmental impacts of goods and services that will include water impacts.

Water-using behaviour

Changing behaviour is difficult, potentially politically contentious and a cautious approach is needed with regard to water because of public health and social justice implications. Metering and variable tariffs are being looked at by the Government (and the Water Saving Group). A range of non-pricing measures are also being examined, such as community-based engagement programmes, and there is a growing interest in how to encourage 'whole house' or multi-utility services, whereby the role of Energy Service Companies (ESCOs) is expanded to incorporate a range of household environmental services, including water, food, waste and travel (Lockwood and Murray, 2005).

Improving businesses

What is lacking in the other sectors is at least part developed in the business sector, not least because most non-household customers are already on a meter. Envirowise offers free advice to UK businesses on ways to increase profitability and reduce environmental impact and has a programme on water efficiency. The Enhanced Capital Allowance (ECA) scheme offers tax relief for businesses to invest in products that save water or improve water quality. The ECA maintains a Water Technology List of products that qualify. Companies can claim 100 per cent tax relief for capital costs against taxable profits for the period of investment, providing an incentive to companies to invest in water saving technologies, and an incentive for manufacturers to develop more innovative products.

The Secretary of State has to report to Parliament on progress in meeting the duty under the Water Act 2003 in 2007. This provides a good opportunity for the Secretary of State to demonstrate positive leadership and commit to a clear strategy of how the Government plans to take forward demand management in the following three years.

Summary of findings

Water companies

- Companies have a duty to promote the efficient use of water by their customers and further water conservation. Since 1997 total expenditure and attributable water savings from water efficiency and supply pipe leakage activities have declined.
- Most companies (with exceptions) do a minimum level of water efficiency activity, often entailing cheap, as opposed to cost-effective, measures that deliver small and transient savings.
- There is considerable variation across companies as to what they report as water efficiency activity. Ofwat needs to issue clear guidance to water companies on what should be included (or excluded) under water efficiency activity in the annual June returns.
- Based on the limited evidence, for most companies it may be cheaper to save 1Ml of water through supply pipe leakage reduction than through household water efficiency.
- On average, between 2002 and 2005, companies in the Greater South East spent 11.5p and saved 250ml, or the equivalent of a mug of water a day per person per year through household water efficiency (excluding supply pipe leakage) activities. This compares to an average in England and Wales of a spend of 10.5p and savings of 327ml or the equivalent of a can of soda a day per person per year. In an average year water efficiency measures by companies in the Greater South East save a total of 4.6Ml/day.
- The current duty for water companies to promote water efficiency and conservation by its customers is not ensuring that companies in water-stressed areas are delivering more water savings at the household level.
- If the Government is relying on the duty as a key policy driver for making domestic consumers more

water efficient, then it needs to rethink the duty and its interpretation by both Ofwat and the companies.

Public authorities

- Public authorities have a duty to take into account, where relevant, the desirability of conserving water supplied or to be supplied to premises. Action is influenced by the state of local water stress and impacts on development and the community.
- Local authorities and other public bodies are well placed to work in partnership with stakeholders to deliver water savings.
- There is no co-ordinating body to provide advice and information and facilitate the matching of (water company and other) funding with potential projects.
- Local authorities could consider making water conservation a material consideration in Local Development Frameworks, and producing supplementary planning guidance to encourage water-efficient, sustainable new homes.
- The power of 'well-being' could provide a means of taking water efficiency initiatives forward at a local level.

Government

- The *Water Supply (Water Fittings) Regulations 1999* prevent the installation of the least efficient products from the market. They could be more effective if enforcement was changed to the point of sale or manufacture.
- Government should consider whether all homes should be graded against the Code for Sustainable Homes.
- The current market for water-efficient goods and services is limited due in part to a lack of easily accessible product information. Defra is looking at the feasibility of a voluntary labelling scheme for domestic products, which may help transform the market for water-efficient goods.
- Changing water-using behaviour is difficult and potentially politically contentious. A cautious approach is needed because of the possible public health and social justice implications.
- Businesses can already benefit from free advice from Envirowise and tax relief on products that save water or improve water quality through the Enhanced Capital Allowance (ECA) Scheme. Similar schemes are not available to domestic consumers.
- The Secretary of State has to report in 2007 to Parliament on progress in meeting the duty under the Water Act 2003. This provides a good opportunity for the Secretary of State to demonstrate positive leadership and commit to a clear strategy of how the Government plans to take forward demand management in the following three years.

5. Progressing metering

Household water metering and paying for water on a volumetric basis has been a controversial means of demand management in the UK, with concerns over relative cost effectiveness, impacts on large, low-income households, and whether it would provide an incentive for companies to find ways to sell rather than save more water. But in recent years managing demand through metering and associated tariffs has gained broad support from the Government, water industry representatives and consumer groups.

With a current average metering rate of 28 per cent, England and Wales lags behind much of the rest of the developed world in water metering with Austria, Finland, France, Germany, Japan, Korea, Portugal, Australia, Denmark and Switzerland already having 100 per cent metering of single family houses (OECD, 2000). This also contrasts to other utilities, such as gas and electricity, where payment is invariably made on a volumetric basis.

Research has shown that the water savings from household metering are between 10 and 15 per cent in the UK, with significantly larger peak demand savings (Herrington, 2006). The actual figure will vary depending on the structure and level of tariffs and the circumstances of the location and of individual households. There is still a paucity of research on the long-term effects of metering in this country. Without more widespread metering, water companies (and households) will continue to have poor information on how much water is used by households, what factors influence use and how much water is lost through leakage.

Metering allows water to be charged according to how much is used, which many consider to be a fairer way of paying. The current basis of unmeasured charging is economically inefficient, since the charge for an individual household remains the same whatever use is made of the service. Indeed, with some companies the fixed charge, unrelated to a property's rateable value, dominates the water bill. Two neighbouring homes may end up paying very similar bills regardless of whether one household uses more or less water than the other, leaving customers with little incentive to change behaviour or invest in water-saving appliances or devices.

The Water Industry Act 1999 introduced the right to remain on an unmeasured charge and households have a legally protected right to choose whether or not they are charged for water according to a meter. The Act also introduced the right for customers to have a meter installed free of charge where practicable. Companies have had discretionary powers to install meters in all new homes since 1990 (in the absence of rateable values). The Act gave companies further discretionary powers to install meters in properties at change of occupancy and in homes with high-water-using devices (including sprinklers and swimming pools).

Overall metering penetration is rising in England and Wales by about 2 per cent per year, but there are wide variations in metering rates with not all companies choosing to use their discretionary metering powers to the fullest extent. The case for metering is strongest in the South East where per capita consumption is highest and water resources are under the greatest stress. Yet, as figure 5.1 shows, with the exception of Southern, Folkestone and Dover, Mid Kent and South East Water, water companies in the South East have metering rates below the national average. Indeed, in recent years the rate at which optional metering has been progressing in relation to the remaining unmeasured households in a company's area has been lower in two of the South East's currently most drought-hit areas than for any other company in England and Wales: Thames (0.30 per cent in 2003-05) and Sutton and East Surrey (0.67 per cent in 2003-04 and 0.61 per cent in 2004-05), as against a national figure of 1.5 per cent in 2004-05 (Ofwat, 2004b; 2005).

Under the Act, water companies can apply to the Secretary of State to designate a supply zone in their area as 'water scarce'. 'Water scarcity status' sets aside the right of customers in that area to remain on an unmeasured basis of water charging and enables water companies to move more quickly towards higher rates of metering. In March 2006 Folkestone and Dover became the first company to be designated water scarce. This will allow it to increase its metering rate from 40 to 90 per cent over the course of the next ten years and presents an opportunity for a longitudinal study into the impacts of compulsory metering.

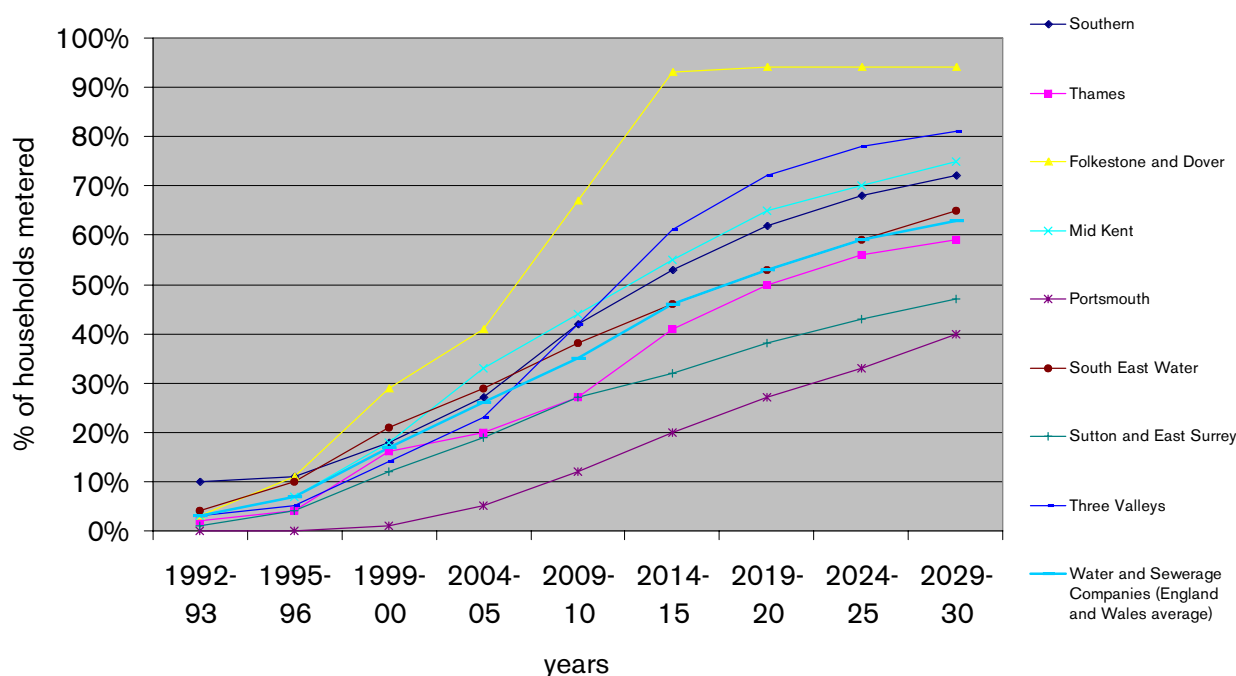
Allowing metering to grow within existing law and policy will mean that progressing metering will be slow. Projections suggest that it will not be until 2030 that 64-67.5 per cent of households in England will be

metered with only a 65-72 per cent penetration in the South East (Figure 5.1). The Government's position is that it is not about to change the law to allow companies to compulsory meter everyone everywhere:

'We do not think that universal compulsory metering is the right way to go, but in areas of water stress there is a strong case for looking at metering, and that is what the Government [is] considering'
 Ian Pearson, Environment Minister, 2006

There are arguments for the transition towards universal compulsory metering on the grounds that the prudent use of water resources is important wherever one lives. Also, unless the majority of households have measured supplies it will not be possible to move towards the widespread introduction of fairer tariffs based on water consumption based on the principle of paying for what is used. But bearing in mind the costs (metering does not often come out as the least cost option in company plans), time and human resources required to increase metering rates, there is merit in focusing efforts in areas where the water supply-demand balance is most under threat. ippr's Commission on Sustainable Development in the South East recommended that higher levels of water metering should be encouraged in areas of low water availability in the South East (ippr, 2005). The Environment Agency has also called for higher levels of metering in the South East (Environment Agency, 2006).

Figure 5.1 Actual and projected metering trends in the South East



Source: 1992-93 to 2004-5, Actual June Return metering numbers from Ofwat; 2009-10, PR04 final determination metering assumption; 2014-15 to 2029-30, Water Resource Plan 2004 Projections

Greater metering in water-stressed areas

The Commission on Sustainable Development in the South East highlighted the importance of encouraging water companies to seek the designation of 'water-scarce areas' as a means of moving more quickly towards higher metering rates where the need is most urgent (that is, in water-stressed areas). It also called for the Environment Agency to be given a stronger role to independently assess when supply zones should be declared as water-scarce areas (ippr, 2005).

The Government-led Water Saving Group recently published a metering proposal (WSG, 2006a) that recognises that the quickest, most cost-effective way to achieve an increase in metering in water-stressed areas will be through further applications for water scarcity status. Following criticism that the first application for water scarcity status by Folkestone and Dover required a lot of administrative effort by the company and took months to be approved, a recent meeting of the Water Saving Group agreed on the importance of learning lessons and streamlining the process (WSG, 2006b). This could include setting a time limit for dealing with applications in the same way the Government sets a 28-day target for

responding to drought orders. However, streamlining the process may not be enough to encourage companies to apply.

No applications for water scarcity status are currently in the pipeline and water companies appear reluctant to apply. This is partly because of the legislative requirements and because water companies are concerned about the potentially negative reaction from their customers. Media coverage of the announcement of the Folkestone and Dover decision propagated public misconceptions about metering. The *Daily Mail* reported 'Water meters will mean higher bills' (Poulter, 2006), preferring to point to the 30 per cent who will likely pay more under metering than the 70 per cent likely to pay the same or less (Defra, 2006b). With the current hosepipe bans and drought orders in place in parts of the country, public awareness about water has increased. Recent public opinion polls suggest that the majority of households (two-thirds) would favour compulsory metering (see, for example, BBC, 2006). For there to be further water scarcity areas declared then the Government, the water companies and the Consumer Council for Water must work together to better communicate the range of benefits of metering to householders.

Identifying water-stressed areas

Despite 'water stress' being a widely used term and one of the Government's Sustainable Development Strategy indicators, there is no agreed classification for determining when an area is water-stressed in the UK. Water stress and security of supply are not the same thing. Security of supply relates to whether or not a company has enough water available to meet demand on the basis of average daily conditions during a dry year. Thus a company's security of supply rating can change relatively quickly with the development or loss of a resource. Water stress is generally seen as an assessment of water availability over the longer term, not only for users of the public water supply but also for other abstractors and in relation to the natural environment. Water stress should also take into account factors such as the effects of climate change.

As part of the work of the Water Saving Group, the Environment Agency is working on identifying areas of water stress, including the development of a set of criteria for determining when an area is water stressed (Defra, 2006c; WSG, 2006b). It should then be possible to develop a map identifying the areas in England where water stress is greatest and where compulsory metering is needed. Building on the recommendations in the WSG metering proposal, members of the Group (not including Defra, who would be responsible for deciding on applications), together with other stakeholders should use this information to publicly urge water companies in areas that have been identified as water stressed to apply for water scarcity status. If this, plus the streamlining of the application process identified above, does not lead to further water scarcity status applications, the Government may need to consider taking stronger action.

Integrating metering and other demand management measures into water resource plans over the medium to longer term

The Water Saving Group has also tried to identify ways of encouraging metering over the medium to longer term through the Water Resource Management Plans (WRMPs) (WSG, 2006a). Water resource plans currently cover all aspects of a company's water balance over a 25 year planning period, with guidance on their content provided by the Environment Agency and Ofwat. Ofwat uses the plans to review water company price limits in the Periodic Review. Under the 2003 Water Act, the next set of WRMPs to be published in June 2009 will be statutory. They will be open to public scrutiny and come to the Secretary of State for assessment.

The Government recently consulted on how it should exercise its powers to issue directions that guide the water resource planning process (Defra, 2006d). It is expected that the Environment Agency will maintain its role in assessing company water resource plans in line with its water resources duties.

Even though the WRMPs will not come into effect until 2009, they offer an opportunity for ensuring that metering (including water scarcity status applications) and all other demand management proposals are considered as part of medium to long term water resource planning (WSG, 2006a). Clearly specifying the expected role of metering and other demand management measures in meeting the supply-demand balance through the water resource planning process would:

- enable water metering and other demand management measures to be considered alongside other supply and demand options to determine which is the most cost effective.

- allow scrutiny of demand management proposals as the Environment Agency, Ofwat and the Consumer Council for Water will all be statutorily consulted as part of the process of preparing the WRMPs.
- better enable customers to scrutinise how their company is planning to meet the supply-demand balance and what the potential role of the customer is expected to be.
- help to ensure that any approved demand management proposals receive funding in the 2009 Price Review, as Ofwat will use the new plans to set future price limits.

Smart meters for smarter tariffs

Currently, the vast majority of water meters installed only measure the total amount of water use without reference to time or day and are not designed to inform the householder of their consumption. 'Smart' or 'intelligent' meters collect and present more information on volumes of use over time. Without smart meters it is difficult to have smart, or variable tariffs, designed to signal costs more closely. Such tariffs can incentivise customers (business and domestic) to optimise their water use. Smart tariffs include rising block tariffs, that penalise 'excessive' consumption by setting higher unit prices for high rates of consumption, and drought tariffs, whereby higher charges are applied to curb water consumption in periods of scarcity.

Basic smart meters and tariffs are widely used in the energy sector. The 'smartest' meters have two-way communication with a consumer interface display, which for greatest effect on consumer behaviour should be placed in a prominent position in the home. These are not yet widely used for any utility in the UK, although a Government-funded trial for smart electricity meters is starting in 2007 and Severn Trent recently launched a smart water meter for domestic properties (ENDS Report, 2006).

As well as demand reduction, with perhaps associated benefits of delaying some supply-side options, other benefits of smart water meters may include giving companies better information on leakage and losses, allowing for better demand forecasting, and allowing remote billing, so sometimes lowering billing costs (depending on the type of meter). There may be cost-saving opportunities through multi-utility smart metering, whereby communication devices are fitted to water (and gas) meters that send information to a smart electricity meter. International experience on smart electricity meters suggests that although the overall benefits to society exceed the costs, government or regulatory intervention has been required to facilitate smart metering because suppliers/distributors cannot capture all the benefits (Owen and Ward, 2006).

According to the consultancy NERA, smart meters and tariffs will have the largest benefit-cost potential in the South East, during peak hours/seasons and during droughts (Baker, 2006). If metering rates are to be rapidly progressed, government, water companies, the regulators and consumer groups need to fully evaluate and communicate the net benefits of introducing smart meters as a matter of urgency. The water sector should also work with other utility sectors to share understanding of how meters can best influence the consumption behaviour of consumers and how best to exploit the potential opportunities for multi-utility smart metering.

Supporting poorer families and vulnerable groups

There is a concern that a minority of large, low income families and other vulnerable groups could end up paying more for their water use in metered areas. Metered households are eligible for the vulnerable groups tariff if they are in receipt of certain income-related benefits, and suffer either from medical conditions that cause a substantial increase in use of water or have three or more dependent children under the age of 19. The tariff caps bills at the average household bill for each water company area and is subsidised by the remaining customers within each company area. The vulnerable groups tariff has, however, been widely criticised by consumer groups because of its restrictive qualification and low take-up. Currently, around 9,000 metered households receive assistance under the scheme (Ofwat, 2006f). While this is an increase of 20 per cent across the industry in the past year, companies must do more to promote this, albeit limited, scheme to those who would benefit.

The National Consumer Council has said a shift towards more compulsory metering would require a 'dramatic improvement in the current pathetic system for helping poorer families who would be hit by higher bills' (Poulter, 2006). Central to winning public and political support for further water metering will be the development of better safeguards for supporting poorer families and vulnerable groups, many of

which do not qualify for the vulnerable groups tariff at present. Following the 2004 Cross-Government Review of Water Affordability (Defra, 2004a), the Government is currently exploring how tariff reform could help to address concerns about affordability.

There is the potential for the design of more innovative social tariffs that redistribute income from better-off to less-well-off households (Ekins and Dresner, 2004; OECD, 2003). For instance, the Flanders region of Belgium has developed a tariff-based solution to its water affordability problems. Since 1997, the first 15m³ per annum per person in each household is provided free of charge. Since most other 'free minima' are based on the household as a unit (regardless of the number of people), this approach has offered a more equitable solution (OECD, 2003).

Significant tariff reform in the UK is, however, likely to be dependent on the widespread penetration of metering. In the interim, as metering levels rise, two options (that are not mutually exclusive) for protecting low income and vulnerable groups could be explored:

1. Extension of the eligibility criteria of the Vulnerable Groups Scheme (customer funded)

The eligibility criteria of the Vulnerable Groups Scheme could be expanded to cover a wider range of low income customers. This option would need to be considered carefully as currently the tariff is subsidised by the remaining customers within each company area. If the scheme is extended it would be important to avoid the cost of help having an unacceptable impact on the bills of other customers, many of whom may also have low incomes.

2. Development of a water affordability grant (government funded)

The Government could develop a grant programme, similar to the one it currently has for tackling fuel poverty called the Warm Front scheme, to specifically address the problem of low income households being least able to afford to update their inefficient water-using goods to more efficient ones. Over the period from 2005 to 2008 the Government will be spending around £800 million on reducing fuel poverty through the provision of grants for energy efficiency measures (Defra and DTI, 2006). A 'water affordability' grant could be made available for households that are metered and have a water-inefficient home. The results of Defra's Water Affordability trial could help inform the feasibility and cost-effectiveness of a scheme.

A fuel-poor household is defined as needing to spend more than 10 per cent of its income on heating. In the absence of a current indicator for defining water affordability the Government should develop a water affordability benchmark in time for the next periodic review in 2009. This could be developed from the Government's original sustainability indicator that customers should spend no more than 3 per cent of household income on water and sewerage bills. As with fuel poverty assistance, the challenge will be devising a means of identifying people who could qualify for a water affordability grant. The eligibility for the Warm Front scheme is largely based on receipt of passport benefits such as Income Support, Housing Benefit and the Working Families Tax Credit. Even though passport benefits are a fairly crude proxy for fuel poverty (for instance, a middle income family claiming the Working Families Tax Credit may not necessarily be fuel poor), they offer the best available means of determining when a household should receive fuel poverty assistance (Foley, 2004). Using the same eligibility criteria for determining when a household qualifies for water affordability assistance would reduce the administrative complexity of introducing a new grant scheme.

Summary of recommendations

- There should be an acceleration of compulsory metering in water-stressed areas – which will largely be in the Greater South East.
- The Government should take forward the proposals of the Water Saving Group to:
 - streamline the water scarcity status process to make it easier for water companies to apply in the coming years
 - integrate the assessment of metering and other demand management proposals into the new statutory Water Resource Management Plans to be published in 2009.
 - In tandem with the above, the Environment Agency should publish a map of England and Wales identifying 'water-stressed' areas. Members of the Water Saving Group and other stakeholders should urge companies in areas that have been identified as water stressed to apply for water

scarcity status. If this does not lead to further water scarcity status applications, the Government may need to consider taking stronger action.

- If metering rates are to be rapidly progressed, Government, the regulators, water companies, and consumer groups need to fully evaluate and clearly communicate the net benefits of introducing smart meters and of potential multi-utility smart metering as a matter of urgency. There may be opportunities to link in with (smart) energy metering requirements currently being explored.
- Water companies need to do more to promote greater customer awareness and take-up of the existing vulnerable groups' tariff.
- Central to winning public and political support for further water metering will be the development of better safeguards for supporting poorer households and vulnerable groups. Over the longer term, this could involve the design of innovative social tariffs. For instance, there could be a free or cheap basic block of water to protect low income, large families that are metered.
- In the interim, as metering levels progressively rise, there are two options that could be taken forward either together or separately:
 1. Expansion of the Vulnerable Groups Scheme to cover a wider range of low income customers. This option would need to be considered carefully to avoid the expansion of the scheme having an unacceptable impact on the bills of other customers, many of whom may also have low incomes.
 2. A Government-funded 'water affordability' grant scheme similar to the 'Warm Front' scheme that helps qualifying households by providing grants to metered households to improve the water efficiency of their homes.
- In the absence of a current indicator for water affordability, the Government should develop a water affordability benchmark in time for the next periodic review in 2009. This could be developed from the Government's original sustainability indicator that customers should spend no more than 3 per cent of household income on water and sewerage bills.

6. Introducing water efficiency targets

A further way in which the efficiency of water use could be improved is through the introduction of water saving or water efficiency targets. While Ofwat sets water companies targets for reducing leakage, as long as they have security of supply, they are under no obligation to ensure they improve the efficiency of water use, especially in homes. Policy interest in water efficiency targets has been inspired by the experiences of the Energy Efficiency Commitment (EEC) – a statutory obligation that sets targets on the energy suppliers to improve energy efficiency in homes (see Box 6.1). The Sustainable Buildings Task Group (2004), the Commission on Sustainable Development in the South East (ippr, 2005) and the Sustainable Development Commission (SDC, 2006) recognised the potential for introducing a Water Industry counterpart to the Energy Efficiency Commitment (EEC) for domestic suppliers. One of the work streams of the Government's Water Saving Group is to examine the feasibility of benchmarks and targets for water saving (Defra, 2005).

Box 6.1. The evolution of the Energy Efficiency Commitment (EEC)

The EEC is the principal policy mechanism driving increases in the efficiency of existing homes. It has both environmental and social aims, to curb carbon emissions and contribute to the alleviation of fuel poverty. Under EEC, electricity and gas suppliers are required to achieve targets for the delivery of energy efficiency improvements in the domestic sector. Suppliers fulfil their obligation by carrying out any combination of approved measures including installing insulation, supplying and promoting low energy light bulbs, high efficiency appliances or boilers, and providing energy service packages. How suppliers achieve the savings is up to them. The only constraint is that they must achieve at least half of their energy savings in households on income-related benefits or tax credits.

The first phase of EEC ran from April 2002 to March 2005 and is expected to save 0.37 Mega (million) tonnes of carbon (MtC) annually by 2010. The current second phase of EEC running from April 2005 to March 2008 has a target roughly double that of EEC 2002-05 and is expected to achieve carbon savings of around 0.62MtC annually by 2010. The assumed average cost of the current phase of EEC to energy suppliers is estimated at less than £9 per fuel per customer per year, around 2 per cent of energy bills. The estimated average ongoing benefit for consumers benefiting from measures under the EEC 2005-08 period in lower energy bills or increased comfort is £15 a year for the lifetime of the measures.

The 2006 Climate Change Programme announced that the target for suppliers to promote energy efficiency improvements will be increased by a further 50-100 per cent under the third phase, which will run from 2008-2011. The 2006 Energy Review committed to maintaining a household obligation on suppliers in some form until at least 2020. It stated that the level of ambition from 2011 should at least be equal to that under EEC3, delivering a minimum of 3-4MtC by 2020.

The Government's aspiration is to encourage energy suppliers to develop new market opportunities to sell energy services, rather than just energy per se, so that what the consumer buys are services for heating, lighting and powering their homes, in the most energy-efficient way practicable. Currently EEC does not extend to routine behaviour measures. The Energy Review proposes that the current EEC, once its third phase expires in 2011, could be replaced by a supplier obligation based on a tradable target set in terms of reducing absolute energy demand or carbon emissions from the household sector. Such an obligation would focus energy suppliers' attention on how to deliver energy efficiency to their customers as a marketable service rather than a regulatory requirement.

Sources: HM Government (2006), DTI (2006) and Defra (2004b)

Targets for water saving – some considerations

Targets for water-saving need to be transparent, simple to understand and evaluate, achievable and ideally work within the existing regulatory system. Responsibility for meeting the target should be placed on that body with the greatest influence on the delivery of the target. That body should have the confidence that they have the means available to them to achieve the target. Setting a target on one body does not absolve other stakeholders of their responsibility to help deliver the target.

Two forms of a water saving target are gaining currency (WSG, 2006b), both of which would place

responsibility to meet them on water companies. One is based on total demand (referred to as water into supply) and one is based on pcc.

Overarching water-into-supply targets for companies are attractive, both in terms of reducing abstraction and potentially reducing the regulatory burden on water companies. Companies would be free to meet their water-into-supply targets through reducing leakage, increasing metering and promoting water efficiency. This form of target would, however, remove the focus on leakage and call into question whether there could also be leakage targets. At a time when there is much public concern about leakage this could create mistrust among consumers. Water-into-supply targets may, in some ways, replicate abstraction limits set through abstraction licensing, or Ofwat's assessment of companies against the Security of Supply Index, and would not ensure homes were made more water efficient (if this was the primary objective). While water-into-supply targets could be a longer-term option, and are certainly a useful indicator of demand trends, it would be more politically viable to have separate leakage and water efficiency targets in the shorter term.

Per capita consumption could be a useful target or benchmark to encourage best practice sustainable water consumption and help inform the structure of potential rising block tariffs. However, deriving such a pcc benchmark will not be easy as ideas of what is regarded as 'essential' water use vary from person to person and are influenced by cultural and societal norms and values. There is also the issue of whether a benchmark should reflect actual water consumption (including water-using behaviour) or just the design standard of homes (not including water-using behaviour). If the aim is to influence consumers to reduce consumption, the former is preferable. Although the majority of households in England and Wales are not measured, water companies report average pcc estimates annually. A pcc benchmark or target has the benefit of being easily communicated to householders, providing a simple message on how much water they should be using on average each day.

There is a risk that individual householders who know or believe that they have a pcc below the target level (as a result of improved information on bills) may find it an incentive to use more. A pcc target would give water companies some flexibility about how they met their targets – for instance through increasing metering or increasing other demand management measures where metering is not favoured.

With both these types of targets, water companies could argue their influence is limited. Extreme weather, changing consumer trends and factory closures could raise or lower consumption and thus render the achievement of a target more difficult or easy. But similar issues have not stopped other types of output targets, such as recycling targets, being set or reached. With energy efficiency, consumer trends have made it difficult to turn efficiency savings into net energy savings. But it is thought unlikely that consumers would use water saved by efficiency measures to a significant degree elsewhere. With water metering no evidence has been found of a 'bounce-back' effect (Herrington, 2006), whereby consumers revert to their previous (unmeasured) levels of water consumption due to an insufficient price signal from metering.

Energy saving data has benefited from years of research and experience, driving a rise in monitoring standards. With water there is a significant research gap on the effectiveness of water efficiency measures, particularly over longer time scales and on what factors will have the greatest influence on reducing consumption.

The Energy Review announced that the Government's intention is to evolve the EEC into a mechanism that achieves absolute reductions in domestic energy demand (DTI, 2006). It is doubtful whether the water sector could move to a similar mandatory cap in water consumption in a short time (under five years).

Feasibility of a Water Efficiency Commitment (WEC)

The water sector could learn much from the energy sector, which has been facing similar challenges after a decade of concerted action on how to encourage greater domestic energy efficiency. While initially there was industry scepticism and accusations that the Energy Efficiency Commitment was a form of stealth tax, EEC has evolved to become the principal mechanism for improving the energy efficiency of the existing housing stock. Further, energy suppliers have continuously achieved their targets with relative ease (Box 6.1).

The success of the EEC has been put down to several factors. The three-year period of each commitment round plus clear and early signals on future targets and measures gives energy providers and partners certainty in the longevity and direction of the obligation. Although the three year compliance periods can cause demand disruptions to the supply chain, this is mitigated by the ability to carry over savings into the

following period. There is confidence in the measures invested in, as accredited savings are derived on an ex ante (beforehand) basis and standardised with no regional disaggregation (which also simplifies administration of the scheme). The process is kept simple and transparent, with clear reporting mechanisms that are not too onerous.

There is, however, a lack of transparency on the cost of implementing measures (that is, no market price) and third parties are unable to deliver energy efficiency savings direct to the market.

While the word 'commitment' can raise concerns in some quarters, what it boils down to with respect to water is turning the current duty on water companies to promote water efficiency into targets that deliver quantified gross water savings (expressed in terms of Ml/day). This is different from a pcc or water-in-supply target, as these are based on the achievement of net, not gross, water savings. A water equivalent to EEC would see a water company reaching its target if it delivered a given amount of efficiency savings through various retrofit measures. Consumer behaviour would be factored into the ex ante calculations on how much water is expected to be saved over the lifetime of the measure. How those efficiency savings were used by the consumer subsequently would not affect assessment against the target. A 'Water Efficiency Commitment' could therefore be described as input based while a consumption target (pcc or water-into-supply) assesses success in terms of outcome.

Currently, it seems few companies undertake water efficiency with a specific water-saving outcome in mind. While this research considered the option of a water efficiency target that covered all demand areas (including industry and commercial), it concluded that there were already policy tools in place to improve water efficiency in these sectors, but not in the largest sector – households. There may also be scope for a water efficiency target to cover public buildings such as schools and hospitals.

Water is different to energy and a straight hydro-copy of the EEC is unlikely to be feasible. It would be difficult, for example, to see how the trading of credits between companies could work (although this market mechanism has not been widely utilised under the EEC) and the setting of targets cannot be derived as straightforwardly as in the energy sector since there would need to be a consideration of the geographical variations in the water supply-demand balance. Unlike leakage targets, a WEC would not be based on an economic level of water efficiency, at least initially, as the evidence base is not strong enough at this stage. The roll out of a WEC will help build up the evidence base.

While these (and other) issues complicate how a 'Water Efficiency Commitment'-type model might work, they are not insurmountable and do not rule out the potential for water efficiency targets.

What could a Water Efficiency Commitment do?

Depending on whether it is set on a voluntary or mandatory basis, a WEC offers an opportunity to:

- Ensure water efficiency measures are delivered in homes (if targets are mandatory).
- Raise the profile of water efficiency within the sector and with consumers, and demonstrate that companies want to help households be more efficient.
- Provide an incentive for water companies to improve and deliver water efficiency (either through public pressure if voluntary or through threat of enforcement action if mandatory).
- Give certainty to water companies by standardising savings of water efficiency measures (for the purpose of the Commitment), while building the evidence base on cost-effectiveness and sustainability of different water efficiency measures.
- Provide targeted help for 'Priority Group' customers (low income and vulnerable customers).
- Encourage greater partnership working.
- Help drive innovation and transform the market for water-efficient products and services by giving confidence to partners and manufacturers of a growing market (although this may require a mandatory scheme); and if so,
- Lead a reduction in unit costs and costs of delivery of water efficiency over time.

What a WEC may *not* do is:

- Ensure a change in water-using habits and behaviours, as at least initially, it is likely that only technical

measures could be included in the scheme.

- Ensure a reduction in total or pcc water consumption, as water saved through efficiency measures may be used elsewhere such as by a rising population or changes in water-using habits.

On what basis would targets be set?

National and area targets

Targets are not regionally differentiated under the EEC and so suppliers can claim credits for measures undertaken anywhere in the country. This is because energy savings (and the resulting carbon savings) are of equal value wherever they are achieved. The same is not true for water savings. There is a case for having a national minimum target on water efficiency with enhanced area targets that reflect the longer-term status of water resources. A national baseline target would serve as an indicator of good company practice and enable a consistent national message on the need to use water wisely.

Enhanced targets would be minimal not maximum targets and companies may well exceed the target if it was economically efficient for them to do so to balance supply and demand. Conversely, some companies that currently undertake very little water efficiency activity, or that attribute very low water savings, may argue that a water efficiency target is not conducive with a least cost approach. However, having a minimum target is in line with the thrust of the duty (under the Water Act 2003) to further water conservation, and unless a company's pcc is at the benchmark level, there appears to be no good reason why a company could not be set a target to meet a minimum level of water efficiency.

It would appear logical to link enhanced targets to areas identified as being water stressed. As noted above, in contrast to security of supply, water stress is a better measure of long-term sustainability as it is less influenced by shorter term changes in water resource availability. Making homes more efficient would contribute to tackling longer term water resource issues, rather than shorter term drought issues, for which behavioural responses would be more appropriate. Once the Environment Agency develops a set of criteria for determining when an area is defined as water stressed, this criteria could provide a basis for identifying areas that could be set enhanced water efficiency targets, along with information such as the number of billed connections.

Company or zonal targets

Options for the most appropriate geographical area of a target include the company level, resource zone, river basin or catchment area, government office region, sub region, county or local authority. Given that targets would be imposed on water companies, it is appropriate for the target area to be defined along either company boundaries or water resource zones – the basic units within water resource plans.

There are, however, 118 water company water resource zones in England and Wales, which could complicate target setting. Companies operating across a number of zones could have different target levels, which would hamper the practicality of the scheme and add to the administrative costs of reporting. It may be less burdensome to give water companies a company-wide target that reflects the water resource situation across their company area. Water companies could then decide on how and where to focus water efficiency measures within their company area to meet their targets in the most cost-effective way. Water companies would be the best placed to determine this. The company area approach may need to be reviewed if areas under the most critical environmental stress are not being adequately targeted.

Statutory or voluntary

The EEC sets statutory targets for energy efficiency improvements over a three-year period. If an energy supplier does not meet its target it can be fined up to 10 per cent of turnover. Because of the limited information on the effectiveness of water efficiency measures, a statutory Water Efficiency Commitment would be difficult to set in time for the next periodic review in 2009. Therefore a voluntary approach should be followed initially.

The Government, working with the Water Saving Group and water companies, could develop a voluntary pcc benchmark and identify voluntary water efficiency targets.

The former would advocate good practice household water consumption. If based on design standards it could, for instance, be based on the draft Code for Sustainable Homes, which proposes a minimum design standard of water efficiency of 125 litres per head per day for new homes. If based on actual consumption

then more work would be required to assess what may constitute a sustainable level of water consumption. A pcc benchmark could take into account household size, with benchmarks for one-, two-, three-person (etc.) households, which may be more practicable.

For the latter, the Government could, as a first step, require water companies to identify, in their five year business plans and in their Water Resource Management Plans (WRMPs), what level of gross water savings they aim to achieve through household water efficiency measures. The Government could do this through its issuing of guidance on the duty to further water conservation, due in late 2006. As Environment Agency work on water-stressed areas is concluded, the Government should quantify what water savings it expects companies to reach under the duty by identifying voluntary minimum and enhanced target levels.

As outlined above, statutory rather than voluntary targets offer clear benefits and this should be the future aim should a voluntary approach fail to deliver a suitable step-change in company activity on household water efficiency. The voluntary approach should be reviewed in the run-up to the price review in 2014 with a view to introducing a statutory Water Efficiency Commitment in 2015. Penalties for failure to meet targets could be on a similar basis to that of leakage, whereby Ofwat is given the discretionary power to fine companies a proportion of turnover (up to 10 per cent).

Should a Water Efficiency Commitment have a social obligation?

Like the EEC, a WEC has the potential to serve multiple policy aims. The principal aim would be to contribute to ensuring a secure and sustainable supply of water. A secondary aim could be to contribute to addressing water affordability in household types that are considered 'priority'. Under the EEC these are households that receive one or more income- or disability-related benefit or tax credit. This is based on the principle that measures are needed to ensure companies do not concentrate efforts on those most able to pay, thereby further disadvantaging those on low incomes who are least able to replace their inefficient water using devices and appliances.

The development of a water affordability benchmark (see chapter 5) would help to identify what household characteristics may qualify as a 'priority group' for a potential WEC. As with the EEC Priority Group, the Government, working with water companies and third parties, would need to develop a way of identifying individual members of this group, which will be challenging. However, such identification would make it possible to quantify how a WEC affects the charges of these particular households and provide evidence to show how water efficiency measures help to address affordability. This will be particularly important if it is difficult to assess the costs and benefits of a WEC on a wider scale. If there were to be a social obligation linked to water efficiency targets then the Government would need to ensure that assistance in the form of grants for qualifying households is improved (chapter 5) to reduce the amount of cross-subsidisation by water company customers.

The social aim might in some areas be more of a priority than the principal aim of ensuring a secure and sustainable supply of water (for example, in the South West, where water bills have been rising the fastest). The Government and the Consumer Council for Water should commission research to map affordability across England and Wales to better identify where the two priority areas of water stress and affordability may overlap or be at odds.

How would a Water Efficiency Commitment be operationalised?

Following the lessons learned by the EEC, a future idealised WEC could work as follows:

Government would identify an overall pcc benchmark and set minimum and enhanced water efficiency targets.

Informed by the development of a voluntary pcc benchmark, and in consultation with the regulators, consumer groups and water companies, the Government would set all water companies a baseline water efficiency target (taking into account the number of billed domestic users). Companies would have to deliver a certain amount of gross water savings through domestic water efficiency measures (excluding supply pipe leakage activity). Enhanced targets for water-stressed areas would be standardised into 'stress bands', with companies in the most critical areas having to meet the highest level, while those in moderately stressed areas would be set more moderate targets. Targets would take into consideration what is achievable within a given time frame. Water companies would be required to indicate how they plan to meet their targets and how the targets align with their other water resource plans through their business plans and the new statutory WRMPs.

Government would identify a 'priority group' and set an obligation for companies to meet a proportion of savings in priority group households.

The Government should develop a 'water affordability grant' in a similar way to the 'warm front' grant scheme to subsidise low-income households. This would reduce the amount of cross-subsidy between water company customers to support qualifying households.

The economic regulator (Ofwat) would administer the scheme and the Environment Agency would monitor the scheme.

As Ofwat monitors company activity on water efficiency now, the extra administrative burden would not be as great as with EEC. A unit dedicated to demand management (including water efficiency and the WEC) should be set up within Ofwat, in a similar way to Ofgem. This could utilise and build on the existing expertise in Ofwat, plus that of the Environment Agency's Demand Management Centre and Waterwise (which will disband in 2010). The unit would administer the WEC, develop and administer the list of qualifying measures and contribute to the co-ordination of water efficiency research. There needs to be a clear distinction between scheme administration and monitoring of the scheme's contribution to managing demand and the impact on water stress. As the body with responsibility to manage the natural water resources of England and Wales, the Environment Agency would have this monitoring role.

The WEC would be funded through the periodic review process and the time period of a WEC be aligned accordingly.

Companies should be incentivised through the periodic review process to meet their target as cost-effectively as possible. The WEC period should match the five year price review period. But in light of the need to regularly review targets and to update qualifying measures, there is merit in having an interim review period.

Only measures with an acceptable level of confidence in water savings would qualify.

Savings attributable to many behavioural measures are given with low confidence compared to technical measures. Trying to incorporate behavioural measures would likely delay or stop the delivery of a WEC. It would be simpler if only 'technical' measures were included in the scheme at least initially. There may be scope to include 'technical plus advice' measures (for example, retrofit plus one-to-one advice), if savings were sufficiently robust. With the introduction of a WEC focusing on 'technical' measures, 'soft' measures must become explicit elements of the duty on water companies, and be properly supported by the issuing of best practice guidance and adequate funding.

The list of qualifying measures could be developed from the Water Technology List or from the UKWIR research project Sustainability of Water Efficiency Measures, and be built upon using evidence-based research from companies, Waterwise and others. In calculating the ex ante water savings from each measure, the lifetime of measures should be factored in, so as to benefit longer-lived measures. Water companies would have to calculate their own estimates of 'actual' water savings derived from water efficiency measures for the purposes of resource planning – which would feed back into the calculation of ex ante water savings. If savings could be satisfactorily quantified from metering and/or smart metering, it is possible that metering could qualify as a measure.

A WEC would include incentives to encourage innovation.

A WEC should be designed to encourage particularly innovative schemes, such as grey or rainwater harvesting, smart metering or water service packages, where the confidence level of savings may not yet be robust. In EEC 2002-05 energy service packages and appliance schemes were given an 'uplift in savings', whereby certain measures were weighted so that the energy savings attributed to them were higher to encourage take-up. This made them more cost-effective for suppliers, but had implications for the actual amount of carbon saved. A similar incentive scheme could be developed for water.

Companies would have to demonstrate that water savings were due to their own efforts.

The Energy Efficiency Commitment target includes 'business-as-usual' energy efficiency activity. As a result, suppliers are allowed to tie in with existing programmes but every scheme has to demonstrate that measures being installed are additional to business-as-usual activity. With a Water Efficiency Commitment companies should only be able to claim savings for measures for which they have had some role in funding or delivering. Targets would assume that companies are proactive in working with third parties in finding ways to deliver water savings.

Companies would have freedom to meet the target however they chose.

Companies could meet their target either through complete funding of improvements, part funding ('cashback'-type schemes) or through the marketing of water-efficient goods and services. It would be up to the companies to find the most cost-effective means of meeting the target. In devising schemes, companies should be actively encouraged and supported to co-ordinate schemes with those being undertaken under the EEC and Warm Front and to work in partnership with third parties.

All water customers (except 'able-to-pay' debtors) would qualify for WEC schemes.

Although it will be difficult to market water efficiency schemes to unmetered households, non-metered households should be able to participate in the scheme. This is because unmetered customers will contribute to the funding of a WEC as well as metered customers and should be able to share in the benefits directly. Companies should devise research projects that monitor the effectiveness of measures in non-metered homes, rather than preclude 72 per cent of customers from a WEC.

The Energy Saving Trust's role would be expanded to include water.

There is a need for a 'one stop shop' to facilitate the links between water and energy efficiency programmes and bring together information on measures and potential WEC funding with potential scheme partners. The most appropriate way forward is to broaden the EST's remit to include water, perhaps renaming it the Resource Efficiency Trust.

Clear guidance would be required on the Water Act 2003.

Companies should be given clear guidance on what they are expected to do under the duty to promote water conservation. In the context of a WEC, this should include a requirement to meet their water efficiency targets, but companies should also be encouraged to conduct educational and informational programmes to promote water conservation, and conduct relevant research where appropriate. Similarly, public bodies should be given clear guidance on what their potential roles and responsibilities are and specifically in relation to the proposed pcc benchmark and a WEC.

How do we get there?

Some water companies may already be doing enough to meet what would be required of them under a Water Efficiency Commitment. However, an unknown proportion are not and some of these are in parts of the Greater South East where water resources are under the greatest stress. This report has identified the relatively small amounts of money companies are spending to achieve relatively small levels of water savings through household water efficiency measures. It has explored how rates of metering could be increased and the key issues relating to the feasibility and design of a potential Water Efficiency Commitment.

A fully fledged Water Efficiency Commitment of the kind described above would be difficult to implement in the short term. But there is the potential to move towards developing such a scheme in time for the 2014 periodic review, to start in 2015. The aim should be for water efficiency targets to be set on a mandatory basis, unless a voluntary approach is seen to deliver a suitable step-change in company activity on household water efficiency. This section outlines some of the key steps that could be taken, in the current water planning period (to 2009), the following period (2009 to 2014) and from 2014 onwards.

Action from now to 2009

- The Government should commit to developing a national benchmark for per capita consumption (pcc) of water for encouraging best-practice sustainable water consumption. To help inform this, the Government could encourage companies to develop their own company (or regional) pcc benchmarks for water consumption.
- The Government should commit to setting water efficiency targets for water companies, through a Water Efficiency Commitment, to help deliver water savings in households. This would be an important signifier that companies are committed to helping their customers become more water efficient and not just water frugal. Once the Environment Agency work on water-stressed areas is concluded, and a pcc benchmark is developed, the Government will be in a position to work in partnership with water companies and Ofwat to quantify voluntary minimum and enhanced target

levels for water-stressed areas. Water companies could be encouraged to meet these targets as part of their duty to further water conservation (under the Water Act 2003). The guidance for this part of the Act is due later this year.

- Aligned to this, the Government should also encourage companies to state what quantity of (gross) water savings they aim to achieve and indicate how they intend to achieve these savings in the guidance for preparing the next round of Water Resource Management Plans in 2009.
- A clear signal should be given that the longer term aim is for the voluntary water efficiency targets to become mandatory.
- Government should identify how water efficiency advice and grants will be most effectively dispersed, especially after Waterwise is disbanded in 2010. This could be through an expanded EST.
- Government and other stakeholders should develop a water affordability benchmark and use this to identify (and map) the characteristics of a 'priority group' of low income and vulnerable households.
- Ofwat should set up a demand management unit to co-ordinate the development of a list of qualifying measures, monitor company performance and identify water efficiency research needs. In time this unit would be charged with administering a Water Efficiency Commitment.

Action from 2009 to 2014

- Water companies could start a formalised voluntary water efficiency commitment, under the principles outlined in the previous section.
- A co-ordinating body for water efficiency advice and information could be launched (see above). This would help companies work with third parties to help meet their targets.
- There should be a joint review of the effectiveness of the voluntary approach to water efficiency targets with a view to mandating targets. This review should be conducted in a timely fashion so that mandatory targets could be set through the 2014 periodic review.

Action from 2014

- If recommended, water efficiency targets are placed on a statutory footing. The level and effectiveness of targets are fully reviewed every five years in line with the periodic review, with interim reviews mid-way through the five-year water planning period.

References

Note: web references correct September 2006

Baker W (2006) 'Smart tariffs and smart metering: The economic view'. Presentation given to the Global Smart Metering Summit, London, 30 June. Available at http://www.nera.com/image/EVT_WaterSummit_1247.pps

Bakker K (2003) *An Uncooperative Commodity. Privatizing water in England and Wales*. Oxford: Oxford University Press

Bennett J with Hetherington D Nathan M and Urwin C (2006) *Would you live here? Making the Growth Areas communities of choice* London: ippr

Butler D and Ali Memon F (2006) (Eds.) *Water Demand Management* London: IWA Publishing

BBC (2006) Water Poll for the BBC Daily Politics Show 14-15 June 2006. Available at http://news.bbc.co.uk/1/hi/programmes/the_daily_politics/5086826.stm

Building Research Establishment (2004) 'Energy use and CO₂ emissions in the Water Industry' *BRE Water News* Issue 4

Department for Communities and Local Government (DCLG) (2006a) 'Response to the House of Lords Science and Technology Committee Water Management Report', press notice, 6 June

Department for Communities and Local Government (DCLG) (2006b) 'Towns and cities say 'Yes' to sustainable housing growth', press notice, 20 June

Department for Communities and Local Government (DCLG) (2006c) 'Government announces phased HIP roll-out to begin with energy certificates', press notice, 18 July

Department of Environment and Conservation (New South Wales) (2003) *New South Wales State of the Environment 2003*. Available at <http://www.environment.nsw.gov.au/soe/soe2003/>

Department for Environment, Food and Rural Affairs (Defra) (2006a) *Procuring the future: the Sustainable Procurement Task Force National Action Plan* London: Defra

Department for Environment, Food and Rural Affairs (Defra) (2006b) Written Ministerial Statement by Elliot Morley, Minister of State for Climate Change and the Environment, on Folkestone and Dover Water Services' application to be designated an area of water scarcity, 1 March, London: Defra

Department for Environment, Food and Rural Affairs (Defra) (2006c) 'Water supply in the long term – Water Saving Group outlines progress on action plan', press notice, 20 June

Department for Environment, Food and Rural Affairs (Defra) (2006d) *Consultation on Water Company Resources Management Plan Regulations. A consultation by the Department for Environment, Food and Rural Affairs and the Welsh Assembly Government* London: Defra

Department for Environment, Food and Rural Affairs (Defra) (2005) *Water Saving Group Action Plan* Available at <http://www.defra.gov.uk/environment/water/conserves/wsg/pdf/wsg-actionplan.pdf>

Department for Environment, Food and Rural Affairs (Defra) (2004a) *Cross-Government Review of Water Affordability Report* London: Defra

Department for Environment, Food and Rural Affairs (Defra) (2004b) *The Energy Efficiency Commitment from April 2005 – Consultation Proposals* London: Defra

Department for Environment, Food and Rural Affairs (Defra) (2002) *Directing the flow – priorities for future water policy* London: Defra

Department for Environment, Food and Rural Affairs (Defra) and Department of Trade and Industry (DTI) (2006) *The UK Fuel Poverty Strategy. 4th annual progress report 2006* London: DTI

Department of Trade and Industry (DTI) (2006) *The Energy Challenge, Energy Review*, July 2006, London: DTI

Dresner S, Ekins P and Willis R (2006) *A Green Living Initiative: Engaging Households to achieve Environmental Goals* London: Policy Studies Institute/Green Alliance

- Ekins P and Dresner S (2004) *Green Taxes and Charges* York: Joseph Rowntree Foundation
- ENDS Report (2006) 'Severn Trent launches smart meter' Vol. 378, July, pp25
- Environment Agency (2006 forthcoming) *Retrofitting sustainability in homes – the financial and environmental benefits* Bristol: Environment Agency
- Environment Agency (2006) 'New thinking needed on planning for water resources', press release, 28 June
- Environment Agency (2004) *Maintaining water supply* Bristol: Environment Agency
- Environment Agency (2001) *Water Resources for the Future. A Strategy for England and Wales*, March, Bristol: Environment Agency
- Environmental Change Institute (ECI) (2005) *The 40 % house* Oxford: Environmental Change Institute
- Foley J (2004) *Sustainability and Social Justice* London: ippr
- Greater London Authority (2006) *Review of Powers of the Greater London Authority* London: Greater London Authority
- Hampshire County Council (2003) *Hampshire Water Strategy*. Available at http://www.hampshireswater.org.uk/water_strategy.pdf
- Herrington P (2006) *Critical review of relevant research concerning the effects of charging and collection methods on water demand, different customer group and debt* London: UK Water Industry Research
- Herrington P (1998) 'Analysing and forecasting peak demands on the public water supply' in *Journal of the Chartered Institute of Water and Environmental Management*, 12, pp139-143
- HM Government (2006) *Climate Change – The UK Programme* March, London: Defra
- HM Government (2005) *Securing the future – UK Government Sustainable Development Strategy* London: The Stationery Office
- HM Government (2004) 'Indicators of sustainable development'. Available at <http://www.sustainable-development.gov.uk>
- HMSO (2003) *Water Act 2003* London: The Stationery Office
- HMSO (1999) *Water Industry Act 1999* London: The Stationery Office
- HM Treasury and Office of the Deputy Prime Minister (2005) *The Government's Response to Kate Barker's Review of Housing Supply* London: ODPM
- House of Lords Science and Technology Select Committee (2006) *Water Management*, House of Lords, Science and Technology Select Committee, 8th Report of Session 2005/06, London: The Stationery Office
- Housing Corporation (2006) 'Environmental efficiency assessment for existing homes', news release, 8 June
- Howarth D (2006) 'Legislation and regulation mandating and influencing the efficient use of water in England and Wales', in Memon FA and Butler D (eds) *Water Demand Management* London: IWA Publishing, pp280-304
- Institute for Public Policy Research (ippr) (2005) *Final Report from the Commission on Sustainable Development in the South East* London: ippr
- Kent County Council (2005) *Kent Design Guide 2005-06* Maidstone: Kent County Council
- Local Government Association (LGA) (2005) *Water management vision and case studies* London: LGA
- Local Government Association (LGA) (2003) *Powering up: making the most of the power of well-being* London: LGA
- Local Government Association and Defra (2006) *Sustainable communities: a shared agenda, a share of the action. A guide for local authorities* Didcot: Defra
- Lockwood R and Murray R (2005) *RED Future Currents: Designing for a changing climate – work in progress* London: Design Council. Available at <http://www.designcouncil.org.uk/futurecurrents/downloads/FutureCurrents-RedesigningEnergyPolicy-18-10.pdf>

- Market Transformation Programme (MTP) (2006) *Sustainable products 2006: Policy analysis and projections* Didcot: MTP and AEA Technology
- Market Transformation Programme (2005) *BN DW WC: WC design and efficiency – Briefing note relating to Policy Scenario Objectives in Policy Brief* Updated versions available at www.mtprog.com
- McDonald A (2006) Evidence submitted to House of Lords Science and Technology Select Committee (2006) *Water Management*, House of Lords, Science and Technology Select Committee, 8th Report of Session 2005/06, London: The Stationery Office, appendix 4
- Medd W and Shove E (2005) *Traces of Water Workshop Report 2: water practices and everyday life*. Workshop report from the 2nd Workshop of the UKWIR funded series Traces of Water, 9 June. Available at http://www.lec.lancs.ac.uk/cswm/download/tww2_report1.pdf
- MVA (2003) *Customer research 2003: Periodic Review – National Report*. Available at [http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pr04_cust_res161203_execsum.pdf/\\$FILE/pr04_cust_res161203_execsum.pdf](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pr04_cust_res161203_execsum.pdf/$FILE/pr04_cust_res161203_execsum.pdf)
- Organisation for Economic Co-operation and Development (OECD) (2003) *Social issues in the provision and pricing of water services* Paris: OECD
- Organisation for Economic Co-operation and Development (OECD) (2000) *The Price of Water – Trends in OECD Countries* Paris: OECD
- Office of the Deputy Prime Minister (ODPM) (2006a) 'New projections of households for England and the regions to 2026', ODPM statistical release, 14 March
- Office of the Deputy Prime Minister (ODPM) (2006b) 'Stronger Code for Sustainable Homes as Government implements new building standards to tackle climate change', ODPM news release, 8 March
- Office of the Deputy Prime Minister (ODPM) (2005a) *A sustainability impact study of housing scenarios in England*. An Entec report commissioned by the ODPM and Defra, December 2005, London: ODPM
- Office of the Deputy Prime Minister (ODPM) (2005b) *Proposals for introducing a Code for Sustainable Homes. A consultation paper* London: ODPM
- Office of the Deputy Prime Minister (ODPM) (2003) *Sustainable Communities: building for the future* London: ODPM
- Ofwat (2006a) 'Leakage slightly down – companies warned against complacency' Ofwat press notice, 21 July
- Ofwat (2006b) *Water metering: Position paper*. Available at [http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/PosPaper_Metering240506.pdf/\\$FILE/PosPaper_Metering240506.pdf](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/PosPaper_Metering240506.pdf/$FILE/PosPaper_Metering240506.pdf)
- Ofwat (2006c) Per capita consumption data and map, supplied to authors
- Ofwat (2006d) RD 11/06: Setting leakage targets – review of 'Future approaches to leakage target setting for water companies in England and Wales' (2002) Birmingham: Ofwat
- Ofwat (2006e) 'Thames Water pays the price for its leakage failure', press notice, 4 July
- Ofwat (2006f) 'More low income households qualify for help with metered water bills', press notice, 27 January
- Ofwat (2005) *Security of Supply, Leakage and the Efficient Use of Water, 2004-05 report* London: Ofwat
- Ofwat (2004a) *Future Water and Sewerage Charges 2005-10: Final Determinations (PR04)* London: Ofwat
- Ofwat (2004b) *Security of Supply, Leakage and the Efficient Use of Water, 2003-04 report* London: Ofwat
- Ofwat (1992-93 to 2004-5) 'June Returns'. Available at http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/jr_key_outputs
- Ofwat and Defra (2006) *The development of the water industry in England and Wales* London: Ofwat
- Owen G and Ward J (2006) *Smart meters: commercial, regulatory and policy drivers* London: Sustainability First. Available at <http://www.sustainabilityfirst.org.uk/docs/smart%20meters%20pdf%20version.pdf>

Pearson I (2006) House of Commons oral answer on water resources (answered 22/06/06, published 23/06/06). Hansard reference cc1460-1461

Pocock M (2005) 'Measuring up to efficiency', *Water and Waste Treatment*, vol. 48, Issue 2, pp.33-36

Poulter S (2006) 'Water meters will mean higher bills', *The Daily Mail*, 1 March

Sawkins JW and Dickie VA (2005) 'Affordability of household water and sewerage services in Great Britain' *Fiscal Studies*, vol. 26, no. 2, pp225-244

Sim P, McDonald A, Parsons J and Rees P (2005) *The options for UK Domestic Water Reduction – A Review*, Working Paper 05/03 Version 1.0.

South Staffordshire Water plc (2000) *Water efficiency plan* Walsall: South Staffordshire Water

Sustainable Buildings Task Group (2004) *Better Buildings – Better Lives*. Sustainable Buildings Task Group Report, report to the ODPM, Defra and DTI. London: ODPM

Sustainable Development Commission (SDC) (2006) '*Stock Take: delivering improvements in existing housing*' London: SDC

UK Water Industry Research (UKWIR) (2004) 'Customer debt, backing judgements with facts', *UKWIR News*, issue 33, November

Umwelt Magazin (2006) 'The economic importance of rainwater utilization', cited in *Newsletter of the European Environmental Press*, 3 February 2006. Available at <http://www.eep.org/newsletters/newsletter030206.htm>

UN Water (2006) *Water – a shared responsibility, the United Nations World Water Development Report 2* Paris: UNESCO

Wade S, Fenn T and Barnett C (2006 forthcoming) *Defra Research Contract: Climate Change Impacts and Adaptation – Cross Regional Research Programme (Project C – Water)* (Version: draft final report) Wallingford: HR Wallingford

Water Resources in the South East Group (2004) *A Contribution to Preparation of the South East Plan submitted to the South East Regional Assembly*. Available at http://www.southeast-ra.gov.uk/meetings/advisory/nat_res/water_report.pdf

Water Resource Plans (2004) Metering projections for 2014-15 to 2029-30 for Southern, Thames, Folkstone and Dover, Mid Kent, Three Valleys, South East Water, Sutton and East Surrey and Portsmouth. Accessed from company websites and Environment Agency information

Water Saving Group (2006a) *Water Saving Group metering proposal*. Available at <http://www.defra.gov.uk/environment/water/conserves/wsg/pdf/wsg-meteringpaper.pdf>

Water Saving Group (2006b) Water Saving Group minutes, 18 May, available from: <http://www.defra.gov.uk/Environment/water/conserves/wsg/pdf/mins060518.pdf>

Water UK (2004) *Saving water – how our companies are helping people make the most of a precious resource* London: Water UK

Woking Local Agenda 21 Group (2005) *Greener Homes Guide* Woking: Woking Borough Council

World Business Council for Sustainable Development (WBCSD) (2006) *Business in the world of water – WBCSD water scenarios to 2025*. Available at <http://www.wbcsd.org/DocRoot/BP4XFihOhDi9cTglOrYU/h20-scenarios.pdf>

Yorkshire Water (2005) 'Ofwat's sustainable development duty – a water company perspective', presentation available at [http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/sd_workshop241105_yky.ppt/\\$FILE/sd_workshop241105_yky.ppt](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/sd_workshop241105_yky.ppt/$FILE/sd_workshop241105_yky.ppt)

Appendix 1. Duties to promote water efficiency

Department for Environment, Food and Rural Affairs (Defra)

The Secretary of State has a duty to take steps to encourage the conservation of water and must report to Parliament on what steps have been taken or proposed. The first report is due in April 2007. As well as retaining powers that parallel those of the Director General of Water Services under the Water Act 2003, the Secretary of State has the power to issue social and environmental guidance to Ofwat. The next set of water resource plans will come to the Secretary of State for assessment and he will therefore have the power to direct companies to change their plans to better consider demand management options. The Secretary of State also has the authority to declare an area of 'water scarcity status', enabling the introduction of compulsory water metering in that area.

Office of Water Services (Ofwat)

Under the Water Act 2003 Ofwat has the same duties as the Secretary of State for Defra to promote economy and efficiency on the part of the water companies and to contribute to the achievement of sustainable development. In setting price limits Ofwat only allocates additional earmarked amounts for companies to fulfil their duty to promote the efficient use of water where a company's plan proposes to deliver an additional tangible water saving. Baseline water efficiency activity is funded within base operating expenditure.

Environment Agency

It is the Environment Agency's statutory duty to manage the natural water resources of England and Wales. The Environment Agency's task is to balance conflicting needs of water companies and the environment (for example, habitat protection). Its aim is to ensure that the water resources of England and Wales are used sustainably within the context of the reasonable needs of society.

Water companies

All water companies submit water resources plans as part of the periodic review of water company prices. These plans show how companies intend to provide sufficient water to meet customers' needs for water while protecting and enhancing the environment. The water resources plans submitted to the Agency in 2003 and 2004 also formed the companies' supply-demand balance submissions to Ofwat as part of the 2004 periodic review of water company prices.

Consumer Council for Water

The Consumer Council for Water has the same sustainable development duty as the Secretary of State and Ofwat. It also needs to consider the needs of future as well as existing customers. Apart from representing consumers on any steering groups or bodies it also plays a role in promoting water saving and educating customers on the value of water.

Public authorities

Under the Water Act (2003) public authorities have a duty to take into account, where relevant, the desirability of conserving water supplied or to be supplied to premises. This applies to both their actual use of water and where their functions might have an impact on water use.

Appendix 2a Calculations on water company activity on water efficiency

WATER EFFICIENCY MEASURES (not including supply pipe leakage)

Company	Av. annual expenditure ¹ water efficiency (£) (2002-2005)	Water savings ² due to water efficiency (Ml/d)	Expenditure ¹ (£k) per Ml/d saved ²	Population (av. over period)	Expenditure ¹ per person (£)	Av. annual savings ² per person (l/d)
Cambridge	35,016	0.0833	420	293,650	0.119	0.284
Tending Hundred	8,741	0.023	380	148,690	0.059	0.155
Portsmouth	5,379	0.018	299	672,120	0.008	0.026
Sutton and E. Surrey	98,270	0	n/a	641,520	0.153	0
Bournemouth/W. Hants ³	69,781	0.121	577	423,900	0.165	0.285
3 Valleys	287,473	0.0068	42,275	3,032,520	0.095	0.002
Mid Kent ³	91,375	0.769	119	580,973	0.157	1.324
Anglian and HPL	776,011	1.2	647	4,227,860	0.184	0.284
Southern ³	41,675	0.2733	152	2,280,410	0.018	0.12
Essex and Suffolk	481,803	0.3688	1,306	1,767,990	0.273	0.209
Thames	420,223	1.272	330	8,131,980	0.05	0.156
Folkestone and Dover	1,100	0.011	100	159,620	0.007	0.069
South East Water ³	295,860	0.4733	625	1,388,040	0.213	0.341
Greater South East	Total: 2,612,707	Total: 4.612	Average: 3936	Total: 23,749,273	Average: 0.115	Average: 0.250
Northumbrian (N)	241,274	0.15	1,608	2,487,500	0.097	0.06
Wessex	59,405	0.013	4,570	1,209,210	0.049	0.011
Yorkshire	133,802	5.56	24	4,666,400	0.029	1.19
Bristol	539,460	0.009	59,940	1,058,050	0.509	0.0085
Dee Valley	n/a	0	n/a	257,300	0.01	n/a

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Appendix 2a cont.

Company	Av. annual expenditure ¹ water efficiency (£) (2002-2005)	Water savings ² due to water efficiency (Ml/d)	Expenditure ¹ (£K) per Ml/d saved ²	Population (av. over period)	Expenditure ¹ per person (£)	Av. annual savings ² per person (l/d)
South Staffordshire	81,512	0.267	305	1,234,570	0.066	0.22
United Utilities	111,814	0.21	532	6,694,890	0.017	0.031
South West	155,296	2.85	54.5	1,554,020	0.1	1.83
Dwr Cymru	42,032	0	n/a	2,846,770	0.0015	0
Severn Trent	272,156	1.9	143	7,281,640	0.037	0.261
England and Wales	Total: 4,252,401	Total: 15.58	Average: 5720	Total: 53,039,623	Average: 0.105	Average: 0.327

Notes

1 Costs for three years 2002-03, 2003-04 and 2004-05, all transformed to 2004-05 prices, the first two years being adjusted upwards for inflation by the RPI. Costs may include research, water fitting regulations enforcement and other activities that may not directly relate to attributable water savings. Metering costs and savings are not included under water efficiency and water companies do not report costs of metering separately.

2 Savings figures have been given with variable levels of confidence and should be treated with caution. The lifetime of savings is not accounted for.

3 Data is not available or not clear for all years from 2002-03, 2003-04 and 2004-05.

4 Water efficiency measures may include those targeted at businesses, schools, hospitals etc as well as households.

Source: Data sourced from June return 2005, table 1, supplied by Ofwat. Specific data on costs and water savings of water efficiency measures were sourced from company and auditor appendices to Table 1 of the June returns for each year 2002-03, 2003-04 and 2004-05.

Appendix 2b Calculations on water company activity on supply pipe leakage

SUPPLY PIPE LEAKAGE							
Company	Av. annual expenditure ¹ supply pipe leakage (£) (2002-2005)	Water savings ² due to supply pipe leakage programmes (MI/d)	Expenditure ¹ (£K) per MI/d saved	Population (av. over period)	Expenditure* per person (£)	Av. annual savings ² per person (l/d)	
Cambridge	60,812	0.1	608	293,650	0.21	0.34	
Tending Hundred	35,876	0.01	3,588	148,690	0.24	0.07	
Portsmouth	42,674	0.09	474	672,120	0.063	0.134	
Sutton and E. Surrey	115,241	0.069	1,670	641,520	0.18	0.108	
Bournemouth/W. Hants ³	105,805	0.23	460	423,900	0.25	0.543	
3 Valleys	737,119	0.82	898	3,032,520	0.24	0.27	
Mid Kent ³	106,728	0.599	178	580,973	0.18	1.031	
Anglian and HPL	1,830,578	3.68	497	4,227,860	0.43	0.87	
Southern ³	905,094	6.76	134	2,280,410	0.4	2.96	
Essex and Suffolk ⁴	509,111	1.09	467	1,767,990	0.29	0.617	
Thames	4,630,737	22.2	209	8,131,980	0.57	2.73	
Folkestone and Dover	197,270	0.08	2,466	159,620	1.24	0.501	
South East Water ³	1,405,000	0.43	3267	1,388,040	1.01	0.31	
Greater South East	Total: 15,264,041	Total: 36.158	Average: 1128	Total: 23,749,273	Average: 0.408	Average: 0.806	
Northumbrian (N)	197,170	0.85	232	2,487,500	0.08	0.03	
Wessex	1,366,584	0.1	13,666	1,209,210	1.13	0.08	
Yorkshire	1,220,367	0.6	2,034	4,666,400	0.26	0.13	
Bristol	158,398	0.59	158	1,058,050	0.15	0.56	
Dee Valley	33,813	0.25	135	257,300	0.13	0.97	
South Staffordshire	419,881	0.16	2,624	1,234,570	0.34	0.13	
United Utilities	183,262	0.02	91,618	6,694,890	0.27	0.003	

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Appendix 2b cont.

Company	Av. annual expenditure ¹ supply pipe leakage (£) (2002-2005)	Water savings ² due to supply pipe leakage programmes (MI/d)	Expenditure ¹ (£K) per MI/d saved	Population (av. over period)	Expenditure* per person (£)	Av. annual savings ² per person (l/d)
South West	1,658,462	2.71	612	1,554,020	1.07	1.74
Dwr Cymru	435,853	2.65	164	2,846,770	0.15	0.93
Severn Trent	3,094,158	2.69	1,150	7,281,640	0.42	0.37
England and Wales	Total: 25,681,089	Total: 46.778	Average: 5524	Total: 53,039,623	Average: 0.404	Average: 0.67
Notes	<p>1 Costs for three years 2002-03, 2003-04 and 2004-05, all transformed to 2004-05 prices, the first two years being adjusted upwards for inflation by the RPI. Costs may include some other activities that may not directly relate to attributable water savings.</p> <p>2 Savings figures have been given with variable levels of confidence and should be treated with caution. The lifetime of savings is not accounted for.</p> <p>3 Data is not available or not clear for all years from 2002-03, 2003-04 and 2004-05.</p> <p>4 Essex and Suffolk's supply pipe leakage costs data was adjusted for 2004-05 following new information from the 2006 June returns (source: Ofwat)</p> <p>Source: Data sourced from June return 2005, table 1, supplied by Ofwat. Specific data on costs and water savings of supply pipe measures were checked against company and auditor appendices to Table 1 of the June returns for each year 2002-03, 2003-04 and 2004-05.</p>					