Position Statement and Issue Briefing:

Metering and affordability

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WHO WE ARE

1 Queen Anne's Gate | London | SW1H 9BT
+44 (0) 207 344 1883
research@waterwise.org.uk

www.waterwise.org.uk

Waterwise is an independent, not-for-profit, nongovernmental organisation that promotes water efficiency in the UK. Our aims are to decrease water consumption in the UK by 2010, and to build an evidence base to support large-scale water efficiency initiatives. We are the leading authority on water efficiency in the UK. In England, we sit on the Environment Minister's Water Saving Group, and in Scotland, we convene the Saving Water in Scotland network.

To achieve our aims we work with water companies, governments, manufacturers, retailers, nongovernmental organisations, regulators, academics, retailers, consumers, the media, and other stakeholders.

We conduct our own research and occasionally undertake work as consultants. In addition to research, we are also involved in policymaking, advising, public relations, and other activities.

CONTACT US

Please direct **media enquiries** to Chris Philpot, Communications Manger, on 0207 957 4615 or cphilpot@waterwise.org.uk

For **other questions** related to this briefing, please contact Gareth Walker, Research Associate, on 0207 957 4605 or gwalker@waterwise.org.uk.

POSITION STATEMENT

Metering enables people to realise how much water they use. Waterwise consider metering to be an effective means by which to encourage water efficiency, recover costs of supply accurately, and achieve a fair water charging system with carefully designed tariffs that ensure affordability.

We applaud government actions of removing barriers to meter expansion in areas of water stress, where the introduction of meters may now be made compulsory. We also acknowledge the strong commitment to meter expansion demonstrated by many water companies in their draft Water Resource Management Plans.

Waterwise would like to see a meter in every home in England and Wales by 2020, as agreed under the Blueprint for Water.[i] In areas of water stress, full metering should be achievable by 2015.

We recognise that 'full' metering does not necessarily mean 'universal' metering, since in some cases it is not technically feasible and/or economically justifiable to meter every single property. Some allowance must be made.

Waterwise also note that as meter expansion proceeds, issues of affordability and fairness will surface. Waterwise encourage water companies (and government) to explore different tariff systems to promote the efficient use of water while ensuring affordability.

We welcome the charging review being carried out by HMT and Defra, which will consider the costs and benefits of expanding metering beyond water stressed areas. Waterwise will be responding to this consultation in due course.

ISSUE BRIEFING

Water metering encourages both economic and technical efficiency in water resource management. Economically, an efficient distribution of resources is achieved through the accurate signalling of marginal costs to the consumer and an accurate signalling of consumer preferences to the market. Meters provide a means for such signalling through tariff systems based on volumetric pricing. Costs are signalled to the consumer, and consumer preferences and values to the provider, thus leading to more efficient supply/demand driven distributions.

Technical efficiency, or more specifically how efficiently water is consumed to gain benefit, increases when incentives to reduce consumption are introduced. Whilst being contingent on the tariff employed and the consumers' willingness to pay (collectively termed the 'elasticity of demand'), metering is generally acknowledged as a reliable means through which to manage demand and incentive water wise use. The Environment Agency estimate that a demand reduction of 5-15 percent may be achieved in metered households in the UK.[ii] Studies have shown that water metering does lead to some reduction in water use (figure 1).

FIGURE 1. Existing evidence for the effect of metering on demand.[iii]

Location	Year(s)	Reduction in Demand	
		average	peak
Four Major Studies			
Fylde	1970/1-1971/2	11-14.5%	-
Mansfield & Malvern	1976	12.5% (range: 8-17%)	-
Isle of Wight	1988/9-1991/2	21.3% (19.1%-23.5%)	-
National Metering Trials:	1988/9-1991/2	11% (-2%/17%)[11sites]	aver.P7D [11sites]:
11[9] sites (s.) in England		12% (7%/17%) [9sites]	18%/27% (wet/dry years)
Other Studies			
Anglian Water (SODCON)	1995	'around 15% – 20%'	P7D: 25% to 35%
WRc: 11 UM & 8 M DMAs	1994-96	-	PHR/DR/WRs: ↓ by 16%/13%/10%
Mid-Kent: Oaks Park)Canter-	1993-96	26% (Acorn group J)	3Q (1995): 50%
Mid-Kent: St. Peters)bury	1993-96	14% (Acorn group C)	3Q (1995): 32%
Two Chelmsford areas	1994-95	-	PDR:25%;PWR:26%
F/stone/Dover: 4 retmt.areas	Jan-Aug 1995	-	PWR: 44%/32%
NERA optants only:			
I (5 WCos.)	7/1996 – 12/2001	9%, ↑ to 11% after 1 yr*	PM:16%; PQtr.:13%*
II (3 WCos.)	7/1995 – 6/2002	2-4%,↑to 8-9% after 3yrs*	-

Abbreviations: UM: unmetered; DMAs: District Metering Areas; P7D: Peak 7-day Demand M: metered + vol.charging; PM: Peak Month Demand (Aug) PHR/DR/WR: Peak Hour/Day/Week Ratios; PQtr: June-August Demand. *estimates.at aver. real vol. charge of £1.60/m^3 (Jan.2000 prices)

The outdated 'ratable value' method of calculating water and sewerage charges has created an uneven distribution of charges that do not widely reflect consumption. Recent gentrification and development mean that some properties are undercharged for water consumption. In cases of large properties with low tenancy, charges may be disproportionately large. The lack of proportionality effectively acts as a cross-subsidy, often regarded as unfair by those who opt for a metered charge.

Metering may also have impacts on affordability. Those who currently benefit from skewed charging mechanisms have these benefits removed when a meter is introduced. Volumetric charges must then be accompanied by appropriately designed tariffs that ensure essential water services are affordable to all. Affordability is discussed in a following section.

Data collected from meters have applications beyond informing charges. Information concerning household consumption patterns, seasonal and long-term demand for water, and prevalence of leakage are all allowed by metering, which also supports efficient management of water use. Information collected through metering also benefit customers as it allows for feedback on consumption that may then encourage a reduction of water waste in the home.

Rate of expansion

Meter coverage has grown at a relatively slow rate in the UK, primarily via,

- Installations by request;
- Installations upon change of tenancy;
- Installations in new developments; and, more recently,
- Water Company powers to compulsory metering in water stressed areas.

For some customers the decision to switch to a meter will make economic sense. This is often the case for larger homes with relatively low water use which may have low occupancy, for example, homes occupied by retirees. Despite the fact that a meter may make economic sense for some households, the majority of the English and Welsh publics remain unconvinced of the possibility of savings from metering, viewing flat-rate charges as a lower risk option.

Defra have recently acknowledged in their water strategy, *Future Water* (2008), the flat-rate tariff systems effectively act as a cross-subsidy between customers. Given that many of those switching to metered charges have been contributing to this subsidy, the discrepancy between charges to metered customers and those on flat-rate could potentially increase, leaving those on flat-rate at a disadvantage. Defra and HMT have commissioned an independent review on possible strategies, costs and benefits of expanding metering beyond areas of water stress. We welcome this review and will reply to the consultation, which is expected in late 2008.

There is also an issue over optant metering in that often those who choose a meter use relatively little water already, so arguably water demand overall may not decrease as all homes are metered because the sample will no longer be of optants only.

Affordability

A study by Defra (2004) on water affordability estimated that households in the lowest 20 percent of incomes could see an increase in the percentage of their disposable income spent on water services rise from 2.2 percent to 2.6 percent by 2009.[iv] For the entire population, the raise could be from 1 percent to 1.1 percent. In some areas, for example in the South West where water prices are at their most expensive, the increase could be more pronounced. Single pensioner households in the lowest income quintile could pay an average of 4.9 percent of their disposable income on water charges by 2009.

For more detailed information on water tariffs, refer to Herrington 2007.[v] A brief summary follows:

- Safety nets
    - Legislation: the clearest example of a safety net in the interest of public health is legislation that makes it illegal to disconnect customers for non-payment of debts. This has, however, led to water companies having difficulties recovering debt.
    - Vulnerable Groups Regulations: in the past Ofwat has tended to see water affordability issues as remit of the government. The only national affordability programme is government operated. This programme was launched in 2005 and is targeted to a highly specific definition of 'vulnerable customers'. Those eligible for the programme are already eligible for at least one government benefit or tax credit and must have either three or more dependents in full-time education living in the same household, or at least one member with a predefined medical condition that leads to higher water use. Under these criteria households can elect to be charged according to the average metered charge for a household of their size, or by direct metering - whichever is the lower - thus avoiding penalization for extra water use. The programme has had a very low take-up, with government and Ofwat estimating that only 5-10 percent of those eligible do benefit.[vi]
    - Water Company schemes: in a limited number of cases, affordability has affected individual water companies who have responded with internal subsidies and tariff arrangements. In each case the criterion for qualification has been the presence of at least one government benefit.
- Tariff Solutions: tariffs are as essential to appropriate charging schemes as the meters themselves. As well as signaling scarcity to customers and rewarding efficient use, tariffs are able to address the majority of affordability issues.
    - Orthodox Metered Tariff: this tariff is composed of a standing charge and a linear volumetric charge. Simulations have shows that largely low income groups stand to benefit in proportional terms, largely due to the high presence of pensioner households in the low income group. Those who stand to lose are low income, large families. This is a common issue with meter expansion that may be partially addressed through step tariffs and initial block allowances for essential use.
    - Increasing Block Tariff: this tariff has been simulated for both two and three block scenarios and results have indicated similar conclusions. Low income families saw a disproportionate rise in water bills. 'Heavy losers'(more than £100 per year) were the larger households.
    - Increasing Block Tariff with Initial Allowance: in order to address the impact of IBTs on large families, tariffs that make an initial allowance of 60 m^3 to each household were simulated. It was found that this system actually heightened affordability issues as tariffs for extra water consumption were necessarily higher in order to compensate for the initial free service. This led to 56 percent of large families losing more than £100 per year in a double block scenario, and 58 percent in a triple block scenario.
    - Amended Increasing Block Tariff: a further approach to addressing the impact on low income families is to provide an initial free 'lifeline' allowance for water use based on occupancy. A scenario of 15 m^3 per year for all members of the household and another with a free allowance of 20 m^3 per year for both the first adult and each child were simulated. Results indicate that whilst there was a reduction on impacts to low income families, figures remained at 21 percent and 23 percent of low income families loosing at least £1 a week. The failure of amended increasing block tariffs has in part been attributed to, 1) a lack of previous incentives to reduce discretionary use; 2) valid medical needs for more water in

some households; and, 3) the uneven distribution of inefficient appliances between income groups.

Technology

Technology affects both costs and benefits of expansion in metering. Currently, installation of a conventional water meter costs water companies approximately £200 per property, which they are prohibited from passing on to the property owner. An appropriate balance between investment in capital costs of more sophisticated metering technology and expected impacts needs to be found, in particular regarding justification of spending to the economic regulator.

Automatic Meter Reading (AMR) technology can reduce operational costs by enabling meters to be read remotely through radio signaling. Operational costs may also be lowered because of,

- Reduced customer service costs as information may be more frequently and accurately provided;
- Reduced change of tenancy costs since call-outs for meter readings after a change of tenancy are eliminated; and,
- Less time needed for routine meter readings. In the case of radio AMR a vehicle may drive down a road and read each household. Collection can also be done via service vehicles such as refuse collection.

Depending on the frequency and method of meter reading, AMR technology may also be more effective in leak and meter fault detection. Experience from Australia has shown that AMR readings have supported the 'profiling' of domestic leakage types, allowing water suppliers to contact customers that may have pipe leaks. Uses also extend to identifying customers breaching seasonal restrictions on use.

Smart Metering technology provides an even larger resolution of readings that can be accessed by the user. Awareness of water consumption is said to have an effect on behaviour, thus potentially reducing demand. Costs of installation are higher than for conventional meters and the cost/benefit ratio is questionable in the case of the water industry; however, there is scope to integrate water readings with energy and gas initiatives to install smart meters. The government is actively encouraging the installation of smart meters for gas and electricity.

ENDNOTES

[i] http://www.blueprintforwater.org.uk/

[ii] Environment Agency, 2008, "Water Metering", accessed 19 May 2008 from http://www.environment-agency.gov.uk/subjects/waterres/286587/1466399/?lang=_e.

[iii] P Herrington, 2006, "Critical review of relevant research concerning the effects of charging and collection methods on water demand, different customer groups and debt", Report 05/CU/02/1, UK Water Industry Research, London.

[iv] Defra, 2004, "Cross government review of water affordability", accessed 20 May 2009 from http://www.defra.gov.uk/Environment/water/industry/affordability/pdf/wateraffordability.pdf.

[v] *Op. cit.* iii.

[vi] *Op. cit.* iv.