

Policy Position Statement

Water efficiency in the home

Purpose

The purpose of this Policy Position Statement (PPS) is to identify actions that are required by a wide range of stakeholders to encourage greater water efficiency in the UK. This PPS is focused on long-term, sustainable water efficiency in households. The efficiency of water use in other sectors is also an issue within CIWEM's remit but beyond the scope of this PPS.

The need to use water resources more efficiently is driven by the growing national demand for water, as a result of population growth, climate change, and the requirement for access to water by agriculture and business; coupled with the increasing need to retain water in the environment to protect important aquatic flora and fauna. Domestic water efficiency is a necessary part of the solution. It will be delivered by a combination of behavioural change and technological innovation by society, but it must be underpinned by appropriate policy and regulatory measures.

Policy Summary

1. CIWEM believes that payment based on consumption is the fairest way to charge for water services, will deliver real reductions in household water use, and is the method of charging that will encourage society to place a greater value on water. Metering should be compulsory in areas where water resources are under stress, and should be implemented as soon as practical to encourage water efficiency, alongside appropriate tariffs and measures to protect those on low incomes.
2. CIWEM recommends that a further review of the methods for assessment and presentation of water stress should be undertaken, to better reflect the range of risks faced across the country, and to support the promotion of appropriate demand management measures to address those risks.
3. Compulsory metering should also be an option that water companies are able to implement outside areas of serious water stress, if their customers support it.
4. CIWEM believes that smart metering and charging can deliver additional water efficiency and other benefits beyond basic metering. We encourage water companies to investigate how best to provide water use information to customers, taking account of the latest technological opportunities.
5. CIWEM recommends that further evaluation of practical, technical, economic and social issues associated with household water tariffs are undertaken and used to inform charging structures as soon as possible.

6. CIWEM recommends that relevant UK government departments, agencies and regulators consider how regulatory incentives such as progressive tariffs and shadow pricing could encourage greater levels of water efficiency.
7. CIWEM believes that the water industry and other stakeholders should develop and implement projects to improve our understanding of household water use, with a particular focus on the variance in water using behaviour across the population and in times and places of low water resources availability.
8. CIWEM believes that water companies, government and regulators should do more to understand how to influence water use behaviour.
9. CIWEM supports the current and proposed water use standards for new homes in general, but recommends that only product-level standards be adopted and implemented instead of property-level standards. This will overcome the criticism of calculations used to determine property-level standards and enable planners and developers to fit more proven water saving devices. We recommend that more stringent standards be made mandatory for all new homes in areas of designated water stress.
10. CIWEM supports the development of exemplars for water efficiency and believes the practicalities of delivering water neutrality around new developments should be tested further.
11. CIWEM welcomes the development of a water efficiency label for new water-using products and encourages the programme sponsors to extend the scheme beyond bathroom products to all water using devices.
12. CIWEM recommends that water efficiency measures that reduce hot water use should be available as part of the Government's 'Green Deal' measures.

CIWEM recognises that the successful delivery of large water efficiency implementation programmes requires appropriate input from a wide range of stakeholders. We recommend that stakeholders are identified, consulted and involved in a process in which they all accept a shared role in the delivery of water efficiency. This could be via a water saving forum with a clear mission, set of objectives and programme actions to achieve stated aims. This forum could build on the existing Water Efficiency Evidence Base Group.

CIWEM recommends that an important function of a water saving forum is to develop credible and technically robust approaches to determining the most effective ways of reducing consumption. This will need to consider the existing evidence base, the requirements for further research, the design of this research and how the findings should be shared. This work is likely to involve a diverse range of specialists from water resource planners, and behavioural experts, to builders and plumbers.

CIWEM considers that the study, planning and implementation of water efficiency activity, has not always been undertaken with the degree of scientific and technical rigour required to ensure cost-effective and successful outcomes. We believe that increased rigour will be necessary in understanding demand and demand interventions, as companies and other stakeholders look to water conservation as a central part of their water resources plans.

CIWEM is the leading independent Chartered professional body for water and environmental professionals, promoting excellence within the sector.

Why be water efficient?

Water is essential for human life; it is an economic necessity and a pre-requisite for the environmental health of the Earth. Water professionals have a responsibility to encourage water efficiency to ensure an appropriate balance between society's demand for water and environmental requirements to support valuable habitats and species. Achieving this balance in the UK is currently more challenging than many appreciate because the UK has less available water per person than most other European countriesⁱ. This balancing act is set to become more challenging, primarily due to an increasing population, the effect of climate change on our water resources and the increasing pressures brought by calls for greater food security. The treatment of water to comply with increasingly stringent potable standards is also becoming technically challenging and energy intensive as the range and complexity of human-generated pollutants increases.

The UK population is projected to increase from an estimate of 63.9 million in 2014 to 68.6 million by 2025, and 73.9 million by 2040ⁱⁱ. This will have a significant impact on the amount of water we take from the environment, as water supplies to households now account for over fifty percent of the total water abstracted. Water companies' latest plans forecast an 11% reduction in average consumption rates, but this is insufficient to offset the effect of increasing population on total customer demand, across England and Wales¹. The latest UK Climate projections (UKCP09) suggest that on average the UK will experience warming temperatures and changes in seasonal precipitation patterns, while extreme weather events will be more common and more intenseⁱⁱⁱ. Water for agriculture will add further to the pressure on water resources. Evidence suggests these pressures will be greatest in the south and east of England.

Historically, most households in the UK have paid a flat rate for their water services (based on 'rateable value', i.e. a proxy for property value), regardless of actual consumption. But water company forecasts indicate that more than half of homes in England and Wales will be metered by 2020^{iv}. This would mean that the majority of households will be paying for what they consume, and that being water efficient will reduce water bills.

Legislative and regulatory context

At a European level, Article 9 of the Water Framework Directive requires the implementation of pricing policies that provide an incentive to use water efficiently. Article 9 also requires cost-recovery (including environmental and resource costs) for water services, taking into account the polluter pays principle^v. This in theory should require everyone who places a demand on the water environment, including household customers, to pay for the full cost of these services including environmental and social externalities that are not currently included.

¹ Based on a review of Water Resource Management Plan Final Plans, though per capita consumption and total demand data were not published for several water companies.

In the UK water undertakers have a statutory duty under the *Water Industry Act 1991*^{vi} (as amended) to promote the efficient use of water by their customers. The Water Resources Planning Guideline^{vii} sets the framework for water companies in England and Wales to manage their supply and demand over a 25-year period. This guideline requires water companies to demonstrate they have thoroughly explored and tested all demand management options, as part of a 'twin-track' approach. The government owned water companies in Scotland and Northern Ireland have adopted the same general principles of water resources planning from England and Wales.

The *Water Act 2014*^{viii} places a new primary duty of resilience on the financial regulator Ofwat which requires it to "promote measures to manage water sustainably and reduce demand so as to reduce pressure on water resources". Ofwat's approach to price setting and incentivisation has also been revised. Of particular relevance to water efficiency, Ofwat's new 'TOTEX'² approach to assessing expenditure for the AMP6 business plans³ removes incentives for companies in England and Wales to favour capital solutions over operational ones when managing the supply-demand balance.

Ofwat has also shifted towards outcome-based regulation for AMP6 and has asked companies to propose outcome delivery incentives (ODIs) as a way to measure their performance. Companies have set the outcomes they aim to achieve based on customer research, which in many cases has resulted in a focus on reducing demand, including leakage and customer water use. Failure to meet ODIs will result in either financial or reputational penalties (i.e. having to report that they have failed to meet their ODI targets). Several companies, including Thames Water, United Utilities, Anglian Water, South West Water, Southern Water, Bristol Water and Wessex Water have ODIs to reduce household consumption. These consumption targets all aim to reduce household water use over the next five years, so they are therefore water efficiency targets, in effect.

Regulated funding of 'baseline' water efficiency activity will continue in AMP6 as a part of the retail component of water companies, but without the activity-based targets that were in place for AMP5. The Welsh Government is consulting on the development of consumption targets as part of its Wales Water Strategy.

English and Welsh water companies' Water Resource Management Plans now include a more even range of customer-side and supply-side measures, largely as a result of the move away from strict least-cost analysis of supply-demand solutions, to solutions that take more account of the outcomes customers want. It is possible that even greater levels of water efficiency-related activity could be achieved if more regulatory hurdles were removed, or if more incentives were provided. It is unlikely that any new regulatory measures will be implemented before the next planning round (PR19). In the meantime, CIWEM recommends that Defra and Ofwat consider how regulatory incentives such as smart but sensitive tariffs and shadow pricing of water could encourage greater levels of water efficiency.

Water companies and regulators are developing methods and guidance for alternative technical approaches to water resources planning. Some of these methods (some of which may be adopted by some companies in PR19) will take greater account of risk and uncertainty in supply and demand forecasts, to reflect the regulatory drive for greater resilience. Others

² Totex is total expenditure, including both capital and operational expenditure.

³ AMP 6 covers the asset management programme from 2015 to 2020.

are aiming to provide alternative approaches to understanding and forecasting consumption. Such approaches could encourage the adoption of greater and better informed water efficiency activity in future water resources management plans.

Issues and challenges

Engaging all appropriate stakeholders

Many different organisations and individuals have a role in water efficiency, from government departments such as Defra, DCLG and DECC to water companies, manufacturers, retailers, plumbers, builders, and universities, to individual businesses and households. This diverse range of stakeholders needs to have a common understanding and shared responsibility if water efficiency is to be delivered effectively and successfully. Each organisation has a role to play within the wider context of reducing water consumption, but at present there is little or no co-ordination.

Understanding water using behaviour

The adage that you can only manage what you measure is true for water consumption. Water companies undertake ongoing monitoring programmes to quantify consumption by metered and unmetered household customers, and there have been numerous studies to assess the effectiveness of various water efficiency devices and initiatives, and to better understand water use in the home. The water industry continues to deliver valuable research at a company level, or via collaborative projects delivered through UKWIR or the water efficiency fund. Work by others including the Environment Agency and WRAP (in the non-household sector) is also applauded.

CIWEM recognises the value of this work and in particular the commitment and dedication of key individuals involved. As a result there is now greater confidence in average per capita consumption (PCC) trends (over time) and variances (from place to place), in differences in PCC between metered and unmetered customers, and the general breakdown of how water is consumed in the home. Under guidance from regulators, the demand projections produced by water companies over the last two planning periods have however become scenario projections rather than true forecasts.

There is still a relatively poor understanding of the variance in water use across the population, what influences water using behaviours and the effectiveness of many specific water efficiency interventions. CIWEM supports the ongoing work of the water industry and other stakeholders (including academics) to improve our understanding of household water use, with a particular focus on the variance in water using behaviour across the population (by customer segments and by regions).

CIWEM believes that water efficiency needs to be approached with the same scientific rigour as other domains of water management, taking account of the complex interactions between the science of estimating and measuring consumption; the engineering of distribution networks; the technological and market drivers that influence plumbing systems and water-using devices; and the behavioural science that can be used to understand individual customer's water use.

CIWEM believes that we can improve the likelihood that water efficiency will be successful by applying the right scientific principles to research into water use, and by working effectively with research organisations who have particular skills in these areas. CIWEM supports the development of academic courses (from vocational qualifications, through undergraduate and post-graduate courses) to ensure the necessary technical analysis and intellectual rigour is applied to water efficiency.

Influencing water behaviour

CIWEM recommends the water industry and other stakeholders do more to understand how to influence water using behaviour. This includes determining the social norms that reinforce water efficient behaviour, how messages are communicated and how to influence water efficient purchases when buying new water using devices. We believe that metering and tariff setting is one of the strongest ways to influence customer behaviour, regardless of the financial link between water use and bills that metering provides.

This needs to be considered in the context of companies' role as a service provider and society's expectation of utility providers. CIWEM believes that there are opportunities to use behavioural economics or 'nudge theory' to influence water use behaviour in different parts of the population in different ways. These approaches will need to be linked to future developments in metering, smart metering and tariffs, as well as many of the other areas covered in the following sections. As Wessex Water state in their tariff trial report "we need to consider positive approaches to encourage behaviour change rather than ones that are seen as punitive."^{ix} Tariffs that reward reductions in consumption when and where water is scarce are needed, not just ones that penalise high discretionary consumption.

Nudging alone is unlikely to be sufficient. For water efficiency gains of the required magnitude to be achieved, we consider there to be a need for strong leadership from government, regulators and water suppliers, working collaboratively.

Household metering

The *Water Industry Act 1999* and subordinate regulations include the power for water companies to universally meter households if the water company's area has been determined to be an area of serious water stress.

The number of household customers who pay for their water services based on the volume of water consumed is increasing, and approaching fifty percent of all household customers^x. Increased metering rates are a result of more customers choosing to opt for a meter, in order to reduce their water bill; and of the universal metering schemes increasingly being implemented by water companies. These include Southern Water's AMP5-funded universal metering scheme, and a number of compulsory or change of occupier metering schemes that have been funded in AMP6.

Water is a devolved matter in Wales where the Welsh Government is able to legislate on most water and flood matters. As such, the Welsh Government is developing a Water Strategy which indicates that it will consult on a number of options for metering of all water supplies in Wales in a phased and proportionate programme.^{xi}

CIWEM believes that payment based on consumption is the fairest way to charge for water services, will deliver real reductions in household water use, and that this method of charging will encourage society to place a greater value on water. Coupled with sensitive and situation-reflective tariffs, metering can signal where and when water is scarce, and actions need to be taken to conserve a resource under stress. We believe that metering should be compulsory in areas where water resources are, and are at risk of becoming, under stress. This should be implemented as soon as practical, alongside improved tariffs and measures to protect those with low incomes (see section on tariffs).

The Environment Agency updated its water stress classification, presented at a water body and water company level for England and Wales in 2013^{xii}. CIWEM recognises that the methodology behind this updated classification is an improvement upon the original 2007 method. However we are concerned that there has been a reduction in the number of companies classified as being under water stress at a time when climatic and water resources uncertainty has hardly been greater. The number of companies classed as seriously water stressed has fallen from 11 in 2007 to nine in the July 2013 final report, after 15 companies were identified as seriously water stressed in the 2012 draft for consultation. We believe that this trend downplays current and future risks to water resources too far, at a time when the need for greater awareness and control on demand is growing.

We are also concerned that data licensing restrictions limit the transparency of the water stress analysis and as a result it is difficult to understand the reasons for the changes that have been made to water stress classification. We call for greater clarity, for example by publishing sensitivity analysis around the weightings used, and if necessary a review of the water stress classification rules.

Compulsory metering should also be an option that water companies are able to implement outside areas of serious water stress, if their customers support it.

Metering will improve companies' understanding of customer demand. Universal metering in a wide area (e.g. in a district metered area (DMA) or a wider part of a water resource zone) will obviate the need to estimate demand as it will all be measured. This will also enable companies to derive more reliable estimates of other parts of the water balance, notably leakage. Household meters that are installed in the road or pavement will register leaks that occur on customer's supply pipes, which are judged to account for around one third of total leakage across England and Wales. Therefore metering external to the property will not only encourage increased levels of water efficiency, but will also help to reduce leakage.

Metering will also reduce water lost via internal plumbing. An investigation carried out in 2010/11 concluded that approximately ten per cent of toilets leaked, and estimated that in the UK every day about 1.8 billion litres of treated water could be wasted because of wastage from toilets.^{xiii} Other types of internal losses will arise from dripping taps and showers and small unnoticed pipe leaks.

It is important to note that metering will not always result in a household becoming more water efficient, mainly because water consumption tends to be relatively price inelastic (prices have to increase significantly before price has an effect on consumption). Hence universal metering needs to be accompanied by socially acceptable tariffs that encourage water efficiency and protect low income households.

Smart metering

CIWEM supports the implementation of smart metering.

Smart metering means that near real-time consumption data is available from household revenue meters. These data can be accessed by customers, using a range of devices and applications, to enable them to understand and monitor their water use. CIWEM encourages water companies to investigate how best to provide water use information to customers, taking account of the latest technological opportunities such as smart phones, tablets, interactive TV, etc. Smart metering is estimated to result in a twelve per cent reduction in household consumption, compared to a six per cent reduction for 'dumb' metering. Data from smart meters can also be used by water companies to significantly improve their understanding of network operations and leakage. Smart metering also provides the basis for more sophisticated tariff structures, which have the potential to reduce consumption further.

Smart energy metering is preceding the roll-out of smart water metering and it is important that the water industry learns from the energy sector; and seeks out the synergies of smart water and energy metering (for example in understanding, managing and reducing energy use for heating water in the home).

A 20-year smart metering programme has been initiated by Thames Water, starting in its London water resource zone and other water companies are exploring detailed implementation plans for smart metering.

Tariffs

Water companies in England and Wales develop a tariff basket across all their customers, which means that charging structures are broadly the same within each of the main customer groups⁴. The tariff basket is set to achieve an agreed level of income, based on regulator-approved business plans, and achieves a degree of equity by balancing out the actual differences in supply costs (e.g. between urban and rural customers) within each of these groups.

Current unmeasured household tariffs are based loosely on a fixed charge plus a charge per property rateable value. Metered household tariffs include a fixed charge and a fixed cost per cubic metre of water. A significant number of households will be charged for their water services on a metered or smart metered basis in the next 10-15 years, in line with water companies' plans (and powers according to their assessed water stress status) over the next two AMP periods⁵. Appropriate tariffs need to be developed to accompany this change, to achieve the right balance between affordability and resource efficiency. The former pertaining to the needs of low income, high occupancy and high water needs households, and the latter

⁴ The tariff basket is the set of regulated charges to which Ofwat's overall price limits apply. The charges are grouped under five main headings: unmeasured water, unmeasured sewerage, metered water, metered sewerage, trade effluent. The tariff basket formula allows the companies to increase or decrease individual charges by different amounts, as long as the overall average change does not exceed the overall price limit.

⁵ It will not be physically possible, or economically viable to install a water meter at every household property.

to the growing need to signal and charge for water according to the volume taken and the volume available.

Tariff trials undertaken to date⁶ indicate that rising block tariffs for discretionary water use, above a fixed volume for normal use could provide the necessary basic protection for low income and special situation households, and could signal the need for and incentivise action to reduce high discretionary consumption. However another outcome from the trial is that such tariffs are unpopular.

Rising block tariffs do not necessarily require occupancy information and could instead be based on 'baseline consumption', monitored using smart meters during 'off-peak' periods such as October to November and February to March. CIWEM recommends that further evaluation of practical, technical, economic and social issues associated with household water tariffs are undertaken and used to inform charging structures as soon as possible.

New homes

A minimum consumption standard in Part G of the Building Regulations of 125 litres per person per day (lpd) in new homes has been in place since 2010. This standard is to be retained, with an additional voluntary option of 110 lpd. The revised Part G^{xiv} replaces a number of complicated requirements for new development, including the Code for Sustainable Homes (CSH), and these household efficiency levels are equivalent to CSH levels 1/2 and 3/4 for water.

CIWEM supports the water use standards for new homes in general, and recommends that local authorities should require new development to meet the equivalent of the new 110 lpd standard. We support the inclusion of product-level standards for water using devices and encourage their use, in preference to whole-building standards, where possible. Product-level standards have recently been adopted in Scotland for toilets and taps^{xv}. Product-level standards could be explicitly linked to the new water efficiency label performance ratings, which would ensure a consistent approach to water efficient products in new homes and in the refurbishment of existing homes.

We also support the ongoing review of the standards themselves over time. Research has shown that both current whole building standards of 125 lpd and 110 lpd can be achieved at no additional cost, compared to the base / do nothing scenario^{xvi}. Therefore we would expect a move to 110 lpd as a minimum standard in the next five years.

The former CSH level 5/6 of 80 lpd is difficult to achieve without rainwater harvesting or greywater recycling, which remain relatively marginal technologies in the UK mass market. CIWEM supports continued research, development and testing of rainwater and greywater systems, in order to understand their cost-effectiveness and address remaining public health concerns, and determine whether it is feasible for these systems to become more mainstream. In the meantime we recommend that product-level standards can, and should be used to drive

⁶ For example: Wessex Water. 2012. Towards sustainable water charging: conclusions from Wessex Water's trial of alternative charging structures and smart metering.

the installation of more water efficient fittings. Existing guidance, such as that of the AECB^{xvii} could be used by local authorities to set 'good' and 'best' product standards.

Exemplar developments and water neutrality

A significant amount of new housing is required in the UK in order to match housing demand forecasts. Regulation will result in these new houses being built to certain minimum standards of sustainability, including water use, and CIWEM welcomes this. CIWEM also recommends that a small proportion of these developments should be exemplars, which demonstrate how it is possible to go beyond these minimum standards, whilst still remaining financially viable for mainstream developers and attractive places to live for new residents.

The amount of new housing and associated non-household development that is required to sustain the UK economy will inevitably place increased demand on the water environment, unless more action is taken to manage this. Water neutrality has been explored, and proved feasible (in theory) as a way of minimising demand from new development and offsetting this new demand via water efficiency activity in the surrounding area^{xviii}.

The four remaining eco-towns include varying but relatively ambitious commitments to be water efficiency exemplars, and to achieve water neutrality. CIWEM is keen to support the delivery of water efficiency goals stated in the masterplans for these developments. CIWEM also encourages local authorities in areas of water stress to consider the feasibility, funding and delivery of water neutrality initiatives as part of their planning requirements. We also support work to capitalise on the joint benefits of water efficiency, water recycling, water sensitive urban design and effluent reuse.

Water efficient labelling

CIWEM welcomes the development of a water label for new products. The European Water Label^{xix} scheme is being developed and implemented by experienced professionals from a range of stakeholder organisations in a technically robust and commercially viable manner. It should be supported by government, regulators, water companies and others involved in promoting water efficiency.

A water labelling scheme is an essential part of market transformation, as it provides manufacturers, wholesalers, retailers and purchasers with clear, consistent and simple information on key performance criteria of water using products. This kind of initiative should be part of a suite of measures to improve water efficiency in existing households, alongside household metering/smart metering and tariffs.

Water efficiency in non-households

Non-households include a very diverse range of property types: from hospitals to factories; high street shops to holiday parks; offices to airports – with an equally diverse range of water use and water use systems. Nearly all non-household properties in England and Wales are metered, which in theory should provide a financial incentive for the bill payer to be water efficient. However, water is often a relatively small part of operational costs (depending on

the scale/nature of the business) and even low cost or no cost water efficiency measures can be difficult to implement.

The *Water Act 2014* will result in retail competition for non-household customers in England (with no volumetric limit) from 2017. This will result in a seamless market for water services to non-households across England and Scotland, where competition has encouraged greater water efficiency as part of the service offered by new entrants to the market.

WRAP's Rippleffect programme and guidance^{xx} is an excellent source of information on business water efficiency.

The BREEAM scheme provides an established framework for designing and implementing high levels of sustainability, including water efficiency in new non-household buildings. Rainwater and greywater systems are now common in new non-households as a result of BREEAM.

Continuing water efficiency activities

CIWEM fully supports the extensive work done by water companies to meet their statutory obligations to promote the efficient use of water by their customers, through activities such as school education programmes, water audits, retrofits of water saving devices, online and paper-based advice, water use calculators and engagement in the community. This work needs to continue in the context of (smart) metering and new tariffs, and be guided by better insights into water-using behaviour. We also recognise the significant effort by a wide range of other organisations to promote and progress water efficiency in the UK.

CIWEM believes water companies could promote water efficiency more imaginatively via the principal activities outlined in this document, and by engaging with a wider range of stakeholders, from manufacturers and retailers to community groups and credible third-sector organisations or well-known brand owners who have more exposure and market-moving ability than they do.

CIWEM also believes the Government, devolved administrations, local authorities and other stakeholders (e.g. Waterwise and the Energy Savings Trust) also have a role in promoting water efficiency. UK Government bodies should put more emphasis on the role that hot water efficiency can play in achieving statutory CO₂ reduction targets, via initiatives such as the Green Deal. We recommend that water efficiency measures that reduce hot water use should be available as Green Deal measures.

The public sector should provide the lead in promoting the use of water efficient products when publicly owned buildings are upgraded or refurbished. More support should be provided to ensure water efficiency is included in programmes focused on alleviating fuel poverty and maintaining housing standards (such as RENEW^{xxi} in London and 'Arbed'^{xxii} in Wales).

There are many different groups who have an important role to play in delivering water efficiency, including manufacturers, retailers (from large national organisations to smaller local businesses), social landlords, local authorities, consultants/contractors, community groups, charities and academics. Partnership between these kinds of organisations will be critical to enable a real change in how we use water. We recommend that government, regulators and the water industry work collaboratively with all stakeholders to deliver meaningful, measurable

and impactful change. CIWEM recommends that a water saving forum be established, with a clear mission, set of objectives and programme of actions to achieve stated aims.

The new water saving forum should not be a talking shop. It could be held to account by Ofwat. It should use existing activities such as the Water UK Demand Forum, Water Efficiency in Buildings group, the Water Efficiency Awards, and relevant publications, conferences and 'social media' to maximise its impact.

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Note: CIWEM Policy Position Statements (PPS) represents the Institution's views on issues at a particular point in time. It is accepted that situations change as research provides new evidence. It should be understood, therefore, that CIWEM PPS's are under constant review and that previously held views may alter and lead to revised PPS's. PPSs are produced as a consensus report and do not represent the view of individual members of CIWEM.

References

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- i Waterwise. 2012. Water – the facts, accessed at <http://bit.ly/1IQx84t> on 20 June 2014
 - ii ONS. 2014. UK population estimates, accessed at <http://bit.ly/1IEBem4> on 20 June 2014.
 - iii HM Government. 2011. Water for Life. HMSO
 - iv Marshallsay, D. 2015. Water metering – understanding the benefits. Artesia Consulting Ltd. Utility Week Live, April 2015
 - v European Commission. 2012. Communication from the Commission to the European Parliament, the Council and the Committee of the Regions. A Blueprint to Safeguard Europe's Water Resources (COM/2012/673
 - vi *Section 93A Water Industry Act, 1991* <http://www.legislation.gov.uk/ukpga/1991/56/contents>
 - vii Environment Agency, Ofwat, Defra and Welsh Government. 2012. Water resources planning guideline – the technical methods and instructions
 - viii *Water Act 2014.* <http://www.legislation.gov.uk/ukpga/2014/21/contents/enacted>
 - ix Wessex Water. 2012. Towards Sustainable Water Charging
<http://www2.wessexwater.co.uk/about/threecol.aspx?id=9026&linkidentifier=id&itemid=9026>
 - x Utility week. 2014. A smart move for water.
http://www.utilityweek.co.uk/news/a-smart-move-for-water/975152#.U7LVh_IdWfU accessed 01 July 2014
 - xi Welsh Government. 2014. A Water Strategy for Wales – Consultation Document. Number WG21431. 7 April 2014.
 - xii Environment Agency/ Natural Resources Wales. 2013. Water stressed areas, final classification
<http://bit.ly/1okMmDp>
 - xiii Artesia Consulting Ltd. 2012. Final report on leaky toilets projects for a consortium of eight water companies (report reference AR1053, 10 March 2012)
 - xiv *The Building Regulations 2010, Part G approved.*
<http://www.planningportal.gov.uk/buildingregulations/approveddocuments/partg/approved>
 - xv *Scottish Building Standards 2013.* <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013domcomp>
 - xvi Environment Agency: Assessing The Cost Of Compliance With The Code For Sustainable Homes WRc Ref: UC7231
 - xvii AECB. 2009. AECB Water Standards.
<http://www.aecb.net/publications/publication-categories/aecb-water-standards/>
 - xviii Environment Agency. 2007. Delivering water neutrality in the Thames Gateway.

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- https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291668/scho1107bnmc-e-e.pdf
- xix European Water Label. <http://www.europeanwaterlabel.eu/>
- xx WRAP. The Rippleffect - water efficiency for business. <http://www.wrap.org.uk/content/rippleffect-water-efficiency-businesses>
- xxi Greater London Authority. 2014. RE:NEW – Making London’s homes more energy efficient. <https://www.london.gov.uk/priorities/environment/energy/re-new-home-energy-efficiency>
- xxii Welsh Government. 2013. Arbed - Strategic energy performance investment programme <http://gov.wales/topics/environmentcountryside/energy/efficiency/arbed/?lang=en>