

15 September 2017

National Infrastructure Commission
TechnologyEvidence@nic.gsi.gov.uk

Dear Sir or Madam,

Re: National Infrastructure Commission- New Technology Study Second Call for Evidence

Waterwise is pleased to respond to the National Infrastructure Commission's call for evidence on new technology, including water efficiency. Waterwise was founded in 2005 and is the leading authority on water efficiency in the UK and Europe. We are an independent, not for profit organisation, receiving funding from supporters across and beyond the water sector and wider sponsorship and research projects. We like to be at the front, leading and supporting innovative efforts to realise our mission; that water will be used wisely, every day, everywhere.

Water efficiency is a key contributor to resilience, and water companies are currently carrying out large-scale retrofitting and customer engagement programmes. Ofwat and Defra are keen to see greater ambition on water demand management. The Waterwise Water Efficiency Strategy for the UK sets out a range of actions to improve water efficiency in new developments. Waterwise support a national and compulsory rollout of smart metering to provide benefits for customer engagement and water efficiency. We have set out barriers to new technologies as well as a range of new technologies identified by Waterwise and in research internationally.

Attached are our detailed responses to your evidence questions and we would welcome the opportunity to discuss these with you.

Yours sincerely,



Aaron Burton MCIWEM C.WEM CEnv CSci
Director of Policy and Innovation

Response to evidence questions on Water Efficiency

The call for evidence sets out areas for case studies. The narrative for the water efficiency case study is below. In our response we answer the key question on metering and set out wider information in relation to the case study outline to support the NIC New Technology Study.

WATER EFFICIENCY

How can new technologies support the water sector in delivering and driving efficiencies, in terms of operational cost and reduction of leakage and wastage? How can we use new technologies to increase resilience? This case study will look at use of sensors, meters, thermal imaging and drones in the water sector to increase efficiency. It will also compare and contrast different practices amongst the water companies to see how new technology, benefits and understanding can best be shared and tested across the sector. We want to identify the key barriers to rolling out new technologies regionally and nationally.

9. Do you feel that a national and compulsory roll out of smart meters would have a positive or negative benefit in driving and delivering water efficiency and resilience within the water sector? And why?

Waterwise feel that a national and compulsory roll out of smart meters would have a positive benefit in driving and delivering water efficiency and resilience within the water sector. The UK is one of the few countries in the developed world not to have either full water metering or a clear programme to implement universal metering. At present 50% of households in England and Wales are metered and this is projected to increase to 61% by 2020. In England, water companies can compulsorily meter customers if they have been designated as being in an area of water stress (by the Secretary of State based on evidence from the Environment Agency). Otherwise, they can't. In Scotland there are some meter trials but the current level is close to zero, whilst in Wales the Welsh Government is looking at the benefits of smart meters.

Southern Water's Universal Metering Programme (UMP) has shown that domestic metering can save 16.5%. If people do not pay for the amount of water they use, there is no financial incentive to use water efficiently - alongside social norms and other behavioural incentives, which do still exist. For unmetered customers, it is important to seek alternative ways to incentivise the efficient use of water. We are proposing a water meter in most homes in England and Wales (some can't be metered) by 2030, supported by water efficiency and

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political commitment and tariffs to protect vulnerable customers and based on a wider cost-benefit analysis.

The Water Efficiency Strategy for the UK ([Waterwise, 2017](#)) recommended:

- Allow water companies to introduce full metering for benefits beyond areas of designated water stress status
- Fit water meters in almost all homes in England and Wales by 2030, supported by political commitment and tariffs to protect vulnerable customers and based on a wider cost-benefit analysis
- Increase the proportion of smart water meters at company level

As part of a wider cost benefit analysis to enable metering in areas not currently designated as in water stress, smart metering benefits for customer engagement should be considered. Water companies are currently considering the level of smart metering they need to introduce. From a utility perspective it may that drive by readings are sufficient to support billing and detect large leaks. However, for customers to change behaviours they require greater access to their water data and the investment in a fixed area network can provide this.

Managing peak demands and linking with new technologies such as decentralised water management (rainwater harvesting, third pipe systems) can also be supported by roll out of smart metering technology.

Wider response

Innovation in both technology and behaviour change/ engagement approaches are required to deliver and drive water efficiency in the UK.

Variation in water companies delivering technological innovation for water efficiency

There is a wide level of variation in water company use of innovative technology for water efficiency. Those with innovation programmes are more likely to be implementing smart metering and sensors as well as feedback through apps and websites to customers to improve water efficiency. Many companies are still using standard retrofit packs of devices (aerated showerheads, tap aerators etc.) that could be improved upon with greater innovation in water efficiency.

A few examples of current innovation in water efficient technology being implemented by water companies are below:

- Thames Water - [propelair toilets](#), incentives programmes ([Green Redeem](#))
- Anglian Water - [smart metering](#) and behaviour change platform
- SES Water - behaviour change platform ([Advizzo](#))
- Dwr Cymru Welsh Water - [WISDOM](#) project to deliver smart metering and network optimisation

Key barriers to rolling out technologies regionally and nationally

There has been a lack of investment in water efficiency innovation to date in the UK. Although water is a key risk to businesses and lack of resilience would impact on households across the country, investment in new technologies has remained focused on energy when it comes to Smart Cities. The EU ICT4Water Cluster programme has involved many partners in the UK. However, UK based organisations are having difficulties accessing new rounds of EU funding and participating in these projects to help innovation in the UK.

A lack of reliable field trials has been raised as an issue within the ICT4Water cluster programme ([2016 report](#)). Water companies tend to be conservative and won't invest in technologies that have yet to mature. However, technologies can't mature and demonstrate their effectiveness without larger scale field trials in the water company setting. Further investment is required in the UK to support "incubator" programmes for water efficiency and to enable field scale trials so these can form part of water resources management and business plans.

Examples of new technologies

The first Waterwise Water Efficient Product Awards were held in 2017. This enabled us to identify a range of innovative technologies and products for water efficiency. The results are summarised below and links are provided to case studies.

Table Waterwise water efficient product awards 2017 with links to case studies

Category	Winner/Runner-up	Product name	Organisation Name
Kitchen/White Goods	Winner	Whirlpool Supreme Clean Dishwasher – WiO 3T123 6PE	Whirlpool UK
	Runner-up	Whirlpool Supreme Care Washing Machine FSCR 10432	Whirlpool UK
Bathroom	Winner	Propelair 1.5 litre flush toilet	Phoenix Products
	Runner-up	Hydrao	Smart and Blue
Plumbing	Winner	Waterblade	Waterblade
	Runner-up	AquaReturn	AquaReturn
Garden	Winner	Waflo Dual Flow Water Diverter: Filter Unit + H2O harvester brainbox	Waflo
	Runner-up	Watering Pipe	Wateringpipe
Water Storage	Winner	Platin/Minimax Pro rainwater harvesting system	GRAF UK Ltd
	Runner-up	Flushrain	Flushrain

Industrial / Business	Winner	Heatsavr	Brenntag
	Runner-up	Programmable Sensor with Handheld Programmer	Dart Valley
Innovation	Winner	BrighTap	Bwareit
	Runner-up	Aqualogic Aquarius Fixed & Mobile Leak Detection System	Aqualogic
IT / Communications	Winner	Hydrao	Smart and Blue
	Runner-up	Advizzo behavioural customer engagement	Advizzo

A [report](#) by the Institute for Sustainable Futures for several water companies in Victoria, Australia, has identified a wide range of water efficient technologies that should be require further consideration. These include¹:

- Showers - a range of innovative water-efficient showers are hitting the market that potentially offer significant water-savings as well as associated energy savings.
- Showers - other relatively low cost water-efficient shower products are readily available via retailers and online shopping including: shower shorteners, timers, displays and alarms which target reducing shower length; and aerators that focus on reducing flow rate
- Highly efficient clothes washers that incorporate new sensor technologies
- Nylon bead washers in the commercial setting can use up 80% less water
- Supercritical washing machines that use zero water are being developed
- Steaming wardrobes are on the market and can provide an alternative to washing
- High efficiency toilets are available, along with alternative waters that use almost no water
- High efficiency taps with sensors have been developed, along with taps that combine soap
- A range of leak detection devices that can shut off water flow remotely are now available
- Highly efficient dishwashers could use less than 10l/ wash.

¹ Liu, A., Turner, A., and White, S., 2017, Assessment of Future Water Efficiency Measures. Report prepared for City West Water, Yarra Valley Water, South East Water, Melbourne Water, Barwon Water and Department of Environment, Land, Water and Planning by the Institute for Sustainable Futures, University of Technology Sydney.