

Working together in the water sector

wrc 

independent | trusted | innovative

The Economy of a Water City

Wroclaw 2018

Andy Blackhall

Director of Corporate Growth Strategy





group

Established leaders in innovation, we are trusted by a wide range of stakeholders to add value at every level.



water

Sustainable and robust solutions for water utilities, industry and regulators and their customers.



gas

Facilitating transformational change for the UK's gas distribution networks in the path to a low carbon future.



environment

Generating valuable evidence that transforms resource recovery in an evolving circular economy. Strategic consultancy, solutions and technologies to meet a wide range of environmental challenges.



network

Deployment of innovative technologies for inspection, monitoring and management of pipeline infrastructure.

The wrc Vision & Values

independent

Our independence is valued by all our stakeholders. Regardless of the changing demands of the commercial world, our independence is never compromised.

trusted

We have earned the trust of industry, government, academia and the public as a centre of excellence. This drives our continued commitment to deliver world class technical and scientific expertise.

innovative

Throughout our history, we have built our business upon science and engineering excellence, and a foundation of innovation. Whatever the challenge, we nurture and encourage collaboration and new ways of thinking.

“

At WRc, we aim to add value in all that we do. We work with our clients to develop innovative and effective outcomes to help them meet their technical challenges and provide a world-class service to their customers

Mark Smith
CEO, WRc plc

wrc
wrcplc.co.uk

90 years of wrc 1927 – 2017



1989

The UK's water industry is privatised. **WRc plc** is created with staff owning 57% of the voting shares.

1974

Water Research Centre (WRc) is created from the WPRL, WRA and WRB.

WRc WATER RESEARCH CENTRE

1953

Water Research Association (WRA) established to study drinking water treatment and distribution. The following year post-war expansion of WPRL results in a new, permanent laboratory in Stevenage.



WATER RESEARCH CENTRE

1927

Water Pollution Research Board (WPRB) is created as part of the Department of Scientific & Industrial Research.



Water Pollution Research Laboratory (WPRL) opens.

1940

1997

WRc approved – fit for purpose certification scheme.

1992

Explosive atmospheres **FLIDS** methodology.



WRc

1973

The Water Act is the catalyst for industry-wide reorganisation.



1963

Spiralling water consumption prompts the Government to establish the **Water Resources Board (WRB)**.



2007

The first national **FOG** in Sewers Research Programme – Fats Oils and Grease project.

1994

First release of the urban pollution management manual, origin of the **SIMPOL** model.



1990

Major investment is made in our Swindon HQ. Subsidiaries are opened in Europe, Asia and America.



2017

Today, **WRc Group** employs over 150 environmental scientists, engineers, chemists, economists, policy advisers and business analysts.

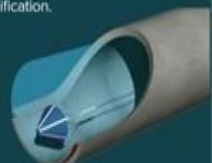
WRc

2015

Cured in place lining (**CIP**) in Gas Sector, the new option for pipe replacement.

2000

Sahara® – in pipe inspection, leak pinpointing and quantification.
























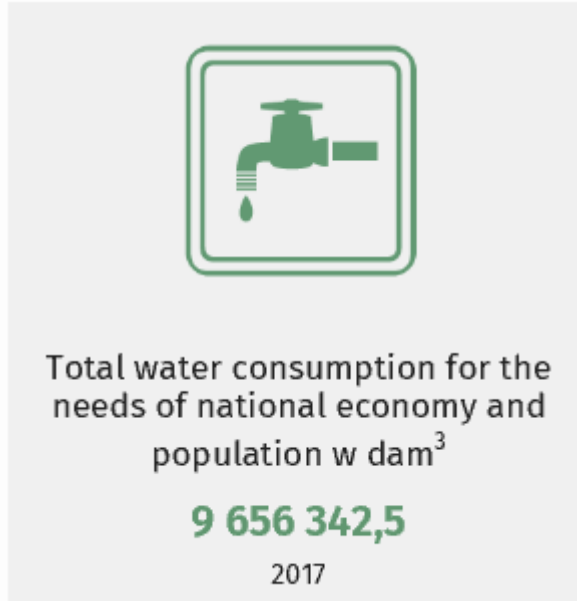
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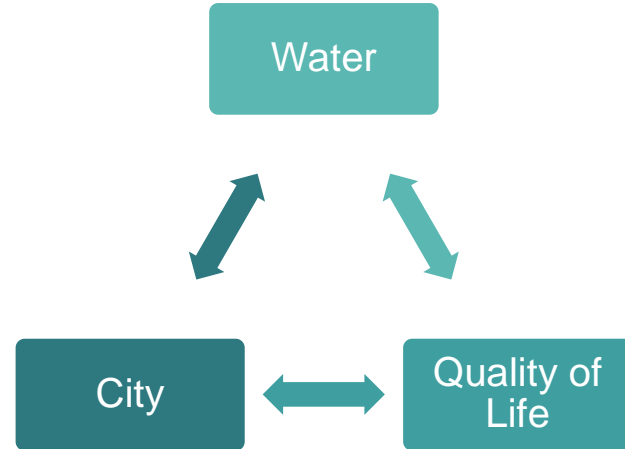


Economy of a Water City

 Population in thous. 38413 <small>June 2016</small>	 Live births per 1000 population 10.3 <small>June 2016</small>	 Natural increase per 1000 population 0.6 <small>June 2016</small>
 Age dependency ratio (non-productive population per 100 working-age population) 63 <small>June 2017</small>	 Unemployment rate in % 5.9 <small>July 2016</small>	 Average paid employment in enterprise sector in thousand 6290.1 <small>August 2016</small>
 Average gross value added in enterprise sector in Pln 4798.27 <small>August 2016</small>	 Average monthly gross retirement and other pension from non-agricultural social security system 2223.39 <small>June 2016</small>	 Basic amount in 3731.13 <small>2017</small>
 State budget revenue in PLN Bn 154 058.6 <small>January-May 2016</small>	 Deficit (balance) of the public finance sector in million Pln 9 585.3 <small>January-May 2016</small>	 Total expenditure of the public finance sector in million Pln 164 423.2 <small>January-May 2016</small>
 Price indices of consumer goods and services 100.0 <small>August 2016</small>	 Dwellings completed 114802 <small>January-August 2016</small>	 Price index of construction and assembling production 102.3 <small>January-August 2016</small>
 The synthetic indicator of the business tendency 109.0 <small>August 2016</small>	 Price of a square meter of stable floor space of a residential building 4 294 <small>July quarter of 2016</small>	 PIB per capita in 48 364 <small>2016</small>
 Area of natural values legally protected in % of country area 32.5 <small>2016</small>	 Total emissions of carbon dioxide in thous.t 370 639 <small>2017</small>	 Total water consumption for the needs of national economy and population in dam ³ 9 656 342.5 <small>2017</small>



<http://stat.gov.pl/en/basic-data/>

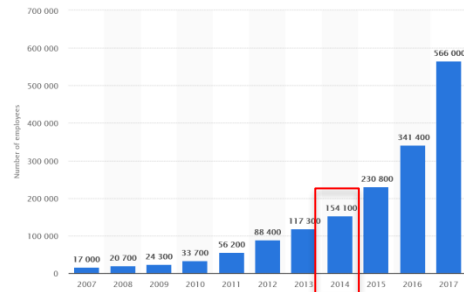




'We wrote the book' on supply chain circular economy

- SUEZ, WRc and GJF Fabrications sponsored a piece of work on moving the UK Supply Chain model to a more sustainable footing
- WRc undertook the review of the UK utilities sector identifying that in 2013:
 - The UK Water Sector alone amounts to an estimated total economic impact of £15bn (GDP of Georgia)
 - A combined workforce of 166,000 people
 - £5bn was spent on operating expenditure
 - Turnover of £11.4bn
- However:
- End of life utilisation of Assets remains a challenge.
- Can there be a better use of space, equipment and technology or co-locating and reuse of end of design life assets?
- Information sharing and competitive risk may be limiting development.

Number of Amazon.com employees from 2007 to 2017



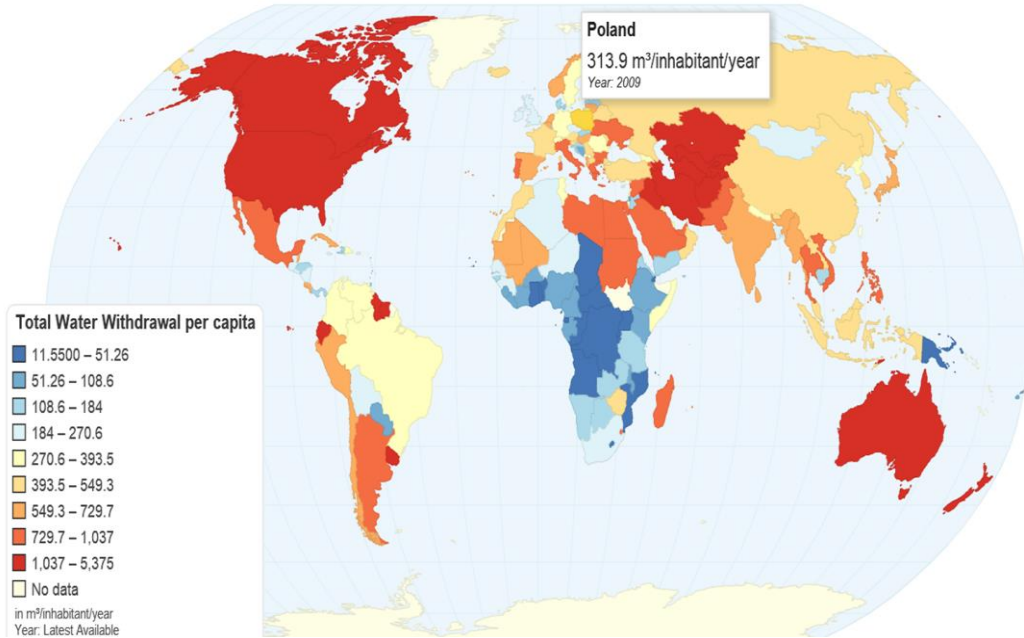
WRc's preliminary
sustainable resource
base

**LINK
TO
LINK**

DRIVING RESOURCE
EFFICIENCY ACROSS
SUPPLY CHAINS

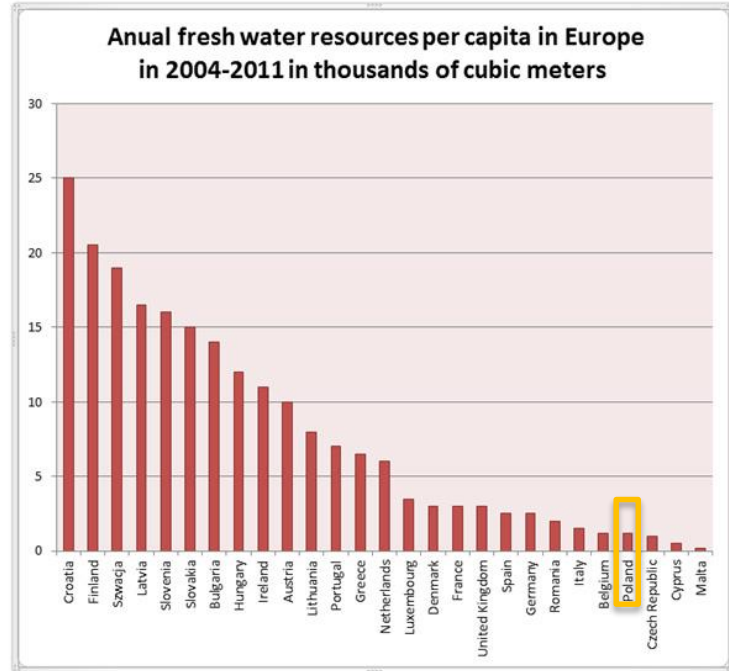
Middle of the Pack?

Total Water Use per capita by Country



<http://chartsbin.com/view/1455>

Annual fresh water resources per capita in Europe in 2004-2011 in thousands of cubic meters



Source: Analysis EY, 2015

Future Drivers for Change

- Population
- Regional Economic Development
- Variability of climate, 'not enough when you need it, too much when you don't'.
- Change of customers relationship with water – greater customer (or consumer) opinion about standards they receive.
- Increasing costs for treatment and distribution
- Competing demands for supplies

Poland: Total population from 2012 to 2022 (in million)

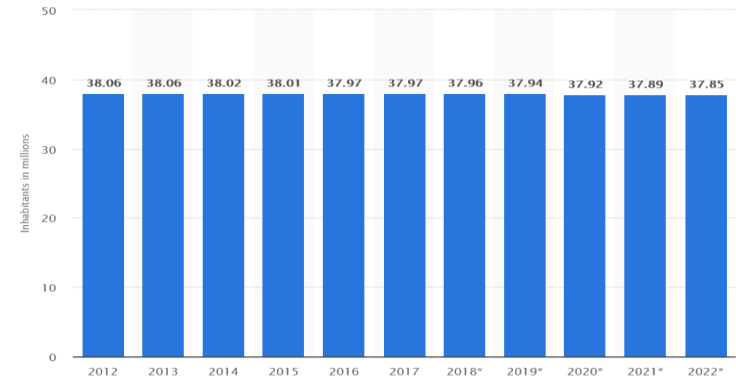
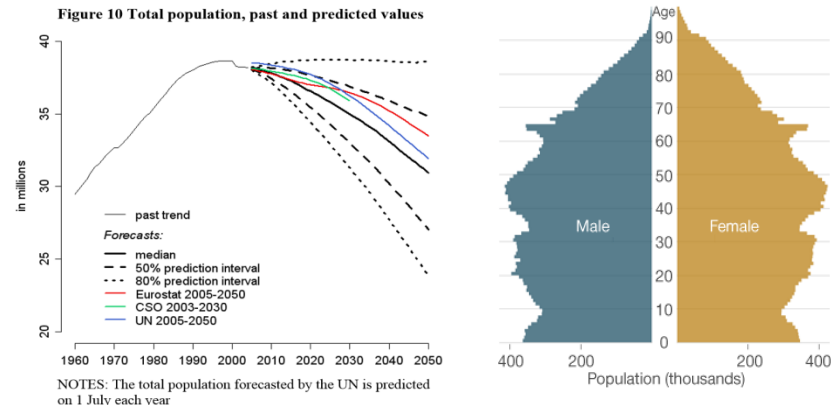


Figure 10 Total population, past and predicted values



ofwat

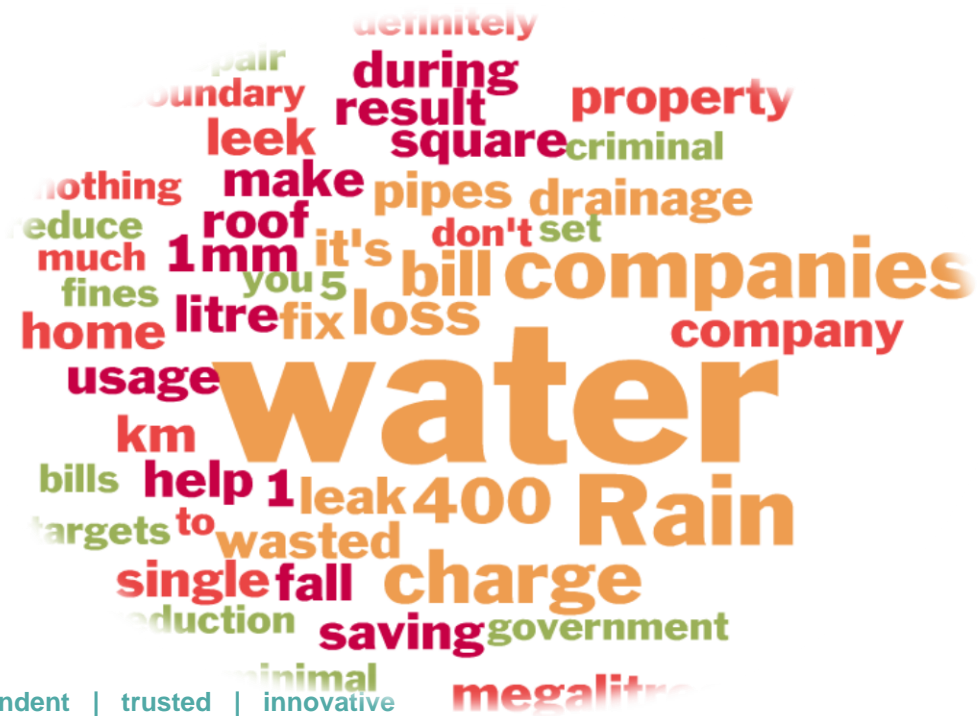
MailOnline

What does it mean to Customers generally



jobs dating more - UK edition -

theguardian



Newest	Oldest	Best rated	Worst rated
View all			
The comments below have been moderated in advance.			
	Angelica , West mids , 3 years ago <p>Tree Fellah - your wrong actually if you have a leak on pipes within your boundary it's your responsibility to fix it and pay for wasted water they are your pipes wherever your stop tap is. However, most water companies will help you repair and make allowances on your bills to help you, they don't have to. Also it's leak not leak a leak in your property is definitely nothing to do with your water company!</p> <p>Click to rate ↑ 51 ↓ 6</p>		
	Brian Taylor , Konia-Paphos, 3 years ago <p>The loss of so much water is criminal The government should set water loss reduction targets over a 5 year period to reduce the loss to a minimal. Failure by companies to do so would result in major fines. My single daughter has just received her water bill for the past 6 months. She was away for almost 3 moths of the bill which amounted to £9 of water usage. Her bill rose to over £61 by the time the water company had put on a service charge, drainage charge, highway drainage charge and a charge for rainwater running off her roof, she can have this removed if it stays on her property. These companies have a licence to print money and it is disgraceful.</p> <p>Click to rate ↑ 84 ↓ 4</p>		
	Hugh Robinson , South Africa, 3 years ago <p>A drive to protect corporate income. Rain water haversting should have been introduced years ago. Water boards and others do not want to so this as they claim the water is not fit for human consumption. But do we have to drink it. NO. 80% of home water usage is wasted in washing cloths bathing and lavatory flushing. Rain fall is said to unreliable. That may not be so but we forget rain falls during drought but not enough to cause a land run off. The objective is to keep the dams full by conserving that stored. A simple rule of thumb is that 1 meg litre water yield is obtainable from 1 km square roofing during a 1mm rainfall. Say London and surrounds has about 400 square km of harvesting potential. This means 400 megalitres of water saving for every 1mm rain. Over 400 kmsq at 20mm of rain the result should be a saving of 800 megalitres. Even a home with a small roof of say 27 sq metres in rain fall of 200mm will harvest 5400 litres. .</p> <p>Click to rate ↑ 38 ↓ 5</p>		
	mr popular , Paignton England, 3 years ago <p>They should be charged for every single litre they lose! Sure they will fix some of the leaks then! them electric companies all as bad as each other! They should all be turned into not for profit companies to make it fair on the consumer who has no choice but to use their services!</p>		

What does it mean to Individual Customers?

discolouration
 communications
 quality environment
 Bills need customer tackle
 taste water affordable
 odour
 tackling protect network
 maintain bursts
 education
 leakage
 improve

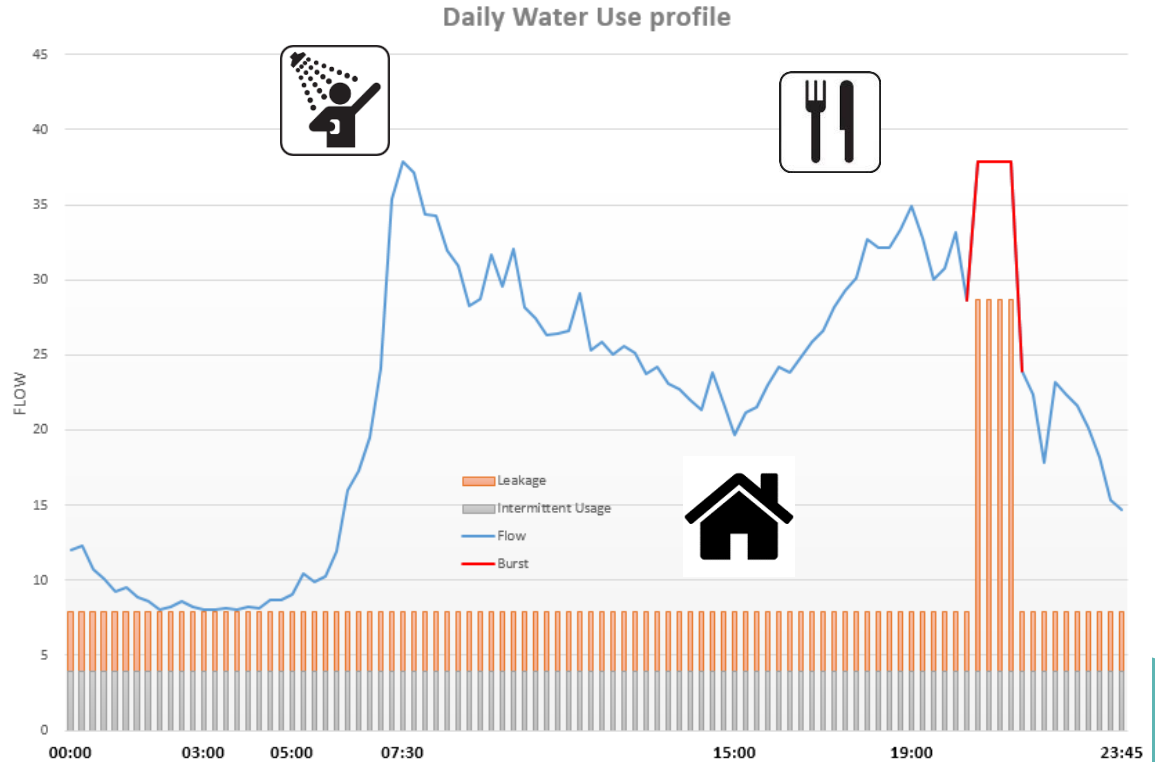
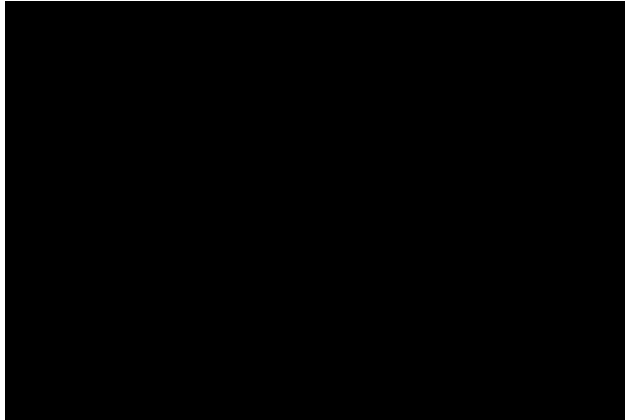
Your Welsh Water

A lot of hard work goes into every drop of water on its journey to and from your home. Here's how your Welsh Water works:



What drives demand?

- Showers are expensive!
- 15 minute resolution too high
- Intermittent 'estimates' of demand
- Its only a leak if we say so
- Current methods aren't cutting it.





The UK Leakage Ambition to 2019

- At Asset Management Period 5 (2014), England & Wales utility level of ambition resulted in a intended leakage level of 3.2Bn Litres per day at 2019.
- Leakage is used as the base planning component of Water Resource Management Plans
- It is the area of demand we have most control over.

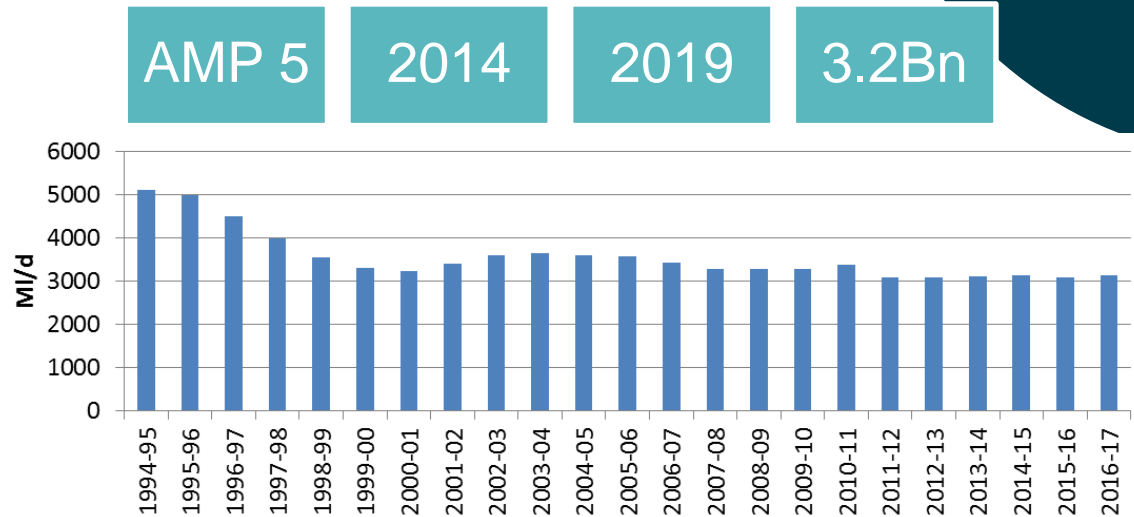


Figure 1.1 Leakage in England and Wales from 1994-05 through to 2016-17. Adapted from sources: Water UK (2017), HM Government (2008), Ofwat (2008), Ofwat (2009), Ofwat (2010)



The 2019 Price Review

- Inconsistencies of calculation methodologies between companies
- Outcome Delivery Incentives leading to concerned customers and stakeholders
- Regulator commissioned a 'Consistency' project to re-align the way the UK reports leakage.
- Regulator established 'discover water' to improve confidence and comparability
- Changes in reported leakage as high as 30% by some companies.

Discover Water.co.uk

Find out how water companies in England & Wales are performing

< Go Back

Leaking pipes

Getting water to your home

Water is brought to your homes through thousands of kilometres of underground pipes. For various reasons, pipes can leak and some water is lost between the treatment works and your home.

342,877 km

Length of water pipes (mains) owned by water companies

Equivalent to



8.5 times
around the equator

Source: Water UK; England and Wales, Apr 2016 - Mar 2017

3,123

Million litres of water leaked each day

Equivalent to

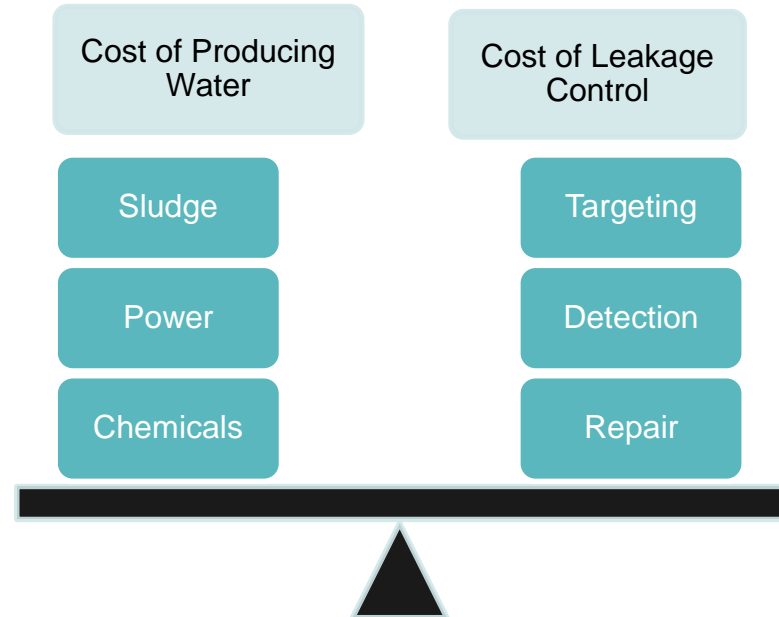


1,249
Olympic swimming pools per day



Sustainable Economic Level of Leakage planning

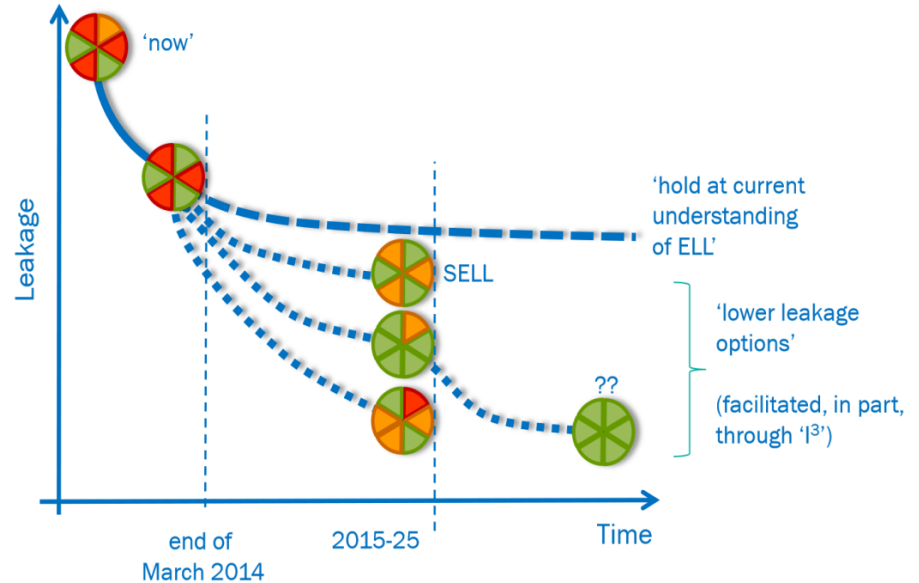
- A short term (typically 5 year) assessment of direct operational costs
- Requires some historic costs, other strategies can be deployed to get you started on the leakage path
- All costs are variable, and are impacted by external factors



Planning for what? Not resilience...

- SELL if used incorrectly can result in a conceited position
- Lack of leadership, or ambition on delivering leakage can be justified by poor planning
- SELL provides annual levels of leakage, it doesn't provide a resilience measure against short term impacts
- Challenging the components of SELL highlights the research needs and sensitivity of components.

Determining an 'acceptable' level of leakage



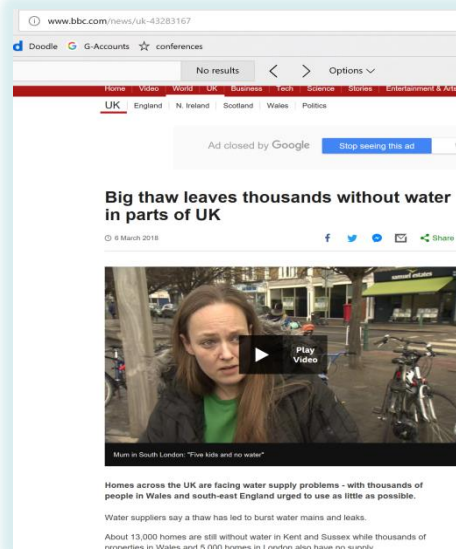
Source: WICS' Presentation to Water UK's Annual Leakage Conference (2010)

Resilience - Freeze Thaw Impacts

- Colder Winters,
- Drier winters,
- Drier Summers.

- Over 13,000 customers impacted in England's main capital city.

- This is in a regulated, developed country



We encourage everyone to follow the advice of their water company and use water wisely.

The National Drought Group (NDG), chaired by the Environment Agency's Chief Executive, brings together government departments, water companies, environmental groups and others to coordinate action to maintain water supplies and manage the other risks associated with drought. The NDG convened today (Monday 23 July) to assess the present situation and coordinate plans for the weeks ahead.

The present situation and the prospects

We are in a continuing period of prolonged hot and dry weather. June 2018 was the driest June since 1925, with a rainfall total for England of only 15 mm.

One water company, United Utilities, has announced its intention to impose a hosepipe ban ("Temporary Use Ban") in parts of the North West from 5 August. The other water companies do not currently intend to introduce hosepipe bans, and there is no threat to essential public water supplies. But continued dry weather into autumn could see the risk of some further restrictions and further environmental impacts across the country.



The 2019 Price Review

- Ofwat mandate a minimum 15% reduction in current level of leakage by water utilities over next 5 year planning horizon
- Reduction of 1.5Bn Litres proposed by the industry over 5 years (EA, 2018)
- 2018 Freeze/Thaw event in the UK see's 1000's of customers without supplies for a period of up to 1 week.

We are challenging companies to set stretching leakage performance commitment levels to:

*• achieve forecast **upper quartile performance** (in relation to leakage per property per day and leakage per kilometre of main per day) where this is not being achieved – or justify why this is not appropriate;*

*• achieve **at least a 15% reduction** in leakage (one percentage point more than the largest reduction commitment at PR14) – or justify why this is not appropriate; and*

*• achieve the **largest actual percentage reduction** achieved by a company since PR14 – or justify why this is not appropriate.
Companies should also justify their leakage performance commitments relative to the minimum level of leakage achievable.*



Water companies in England and Wales to produce Drainage and Wastewater Management Plans by 2022

- A Drainage Strategy should help customers and other stakeholders understand how a water and sewerage company intends to deliver its functions over the long term
- A Drainage Strategy should also explain how a water and sewerage company will do this in conjunction with other organisations (e.g. The Environment Agency, Natural Resources Wales, local authorities, highways authorities, housing developers) and how the company, in turn, will support these organisations in delivering their own responsibilities as well.
- The Drainage and Wastewater Management Plan framework provides the basis for more collaborative and integrated long term planning by companies, working with other organisations that have responsibilities relating to drainage, flooding and protection of the environment.
- The water and wastewater companies in England and Wales will produce Drainage and Wastewater Management Plans using the framework by the end of 2022, to support their business plans for the 2024 Price Review.

Tuesday, 18 September 2018 09:17 Print

Environment Agency issues new guidance to water firms on permits for storm and emergency overflows


font size | Print | Email

The Environment Agency has issued detailed new guidance to water companies on environmental permits for storm overflows and emergency overflows – on issues ranging from drainage strategy, screens, telemetry systems, pumping systems and connections for new developments.

Key issues included in the guidance include:

- Use of urban pollution management (UPM) and a partnership approach
- Design standards for storm overflows
- Water quality standards for freshwaters, bathing waters, shellfish waters, estuaries and coastal waters
- Solutions for unsatisfactory overflows
- Permits for new emergency overflows
- Reporting
- Notification of failures

The Environment Agency regulates intermittent discharges from sewer overflows and waste water treatment works (WWTW) through environmental permits.



Water companies are required to design, construct and maintain sewerage systems according to best technical knowledge not entailing excessive cost (BTKNEEC), together with limiting pollution from storm



Asset Management

**Assuring asset resilience
for future generations**





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Sharing **Innovation** & driving
change in the water industry



wrc portfolio

Knowledge Transfer

The latest WRC collaboration opportunities **for asset solutions**



WRc Portfolio 2018: Tailored, Collaborative Industry Research



Key to icons



Clean water



Regulatory compliance



Innovation



Customer bills affordability



Waste water



Customer engagement



Long term asset view resilience



Leakage

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