WATER REUSE ASSOCIATION

Water Reuse Ready

A report to inform HM Government's roadmap for mandatory water reuse in the UK by 2030

Who are we?

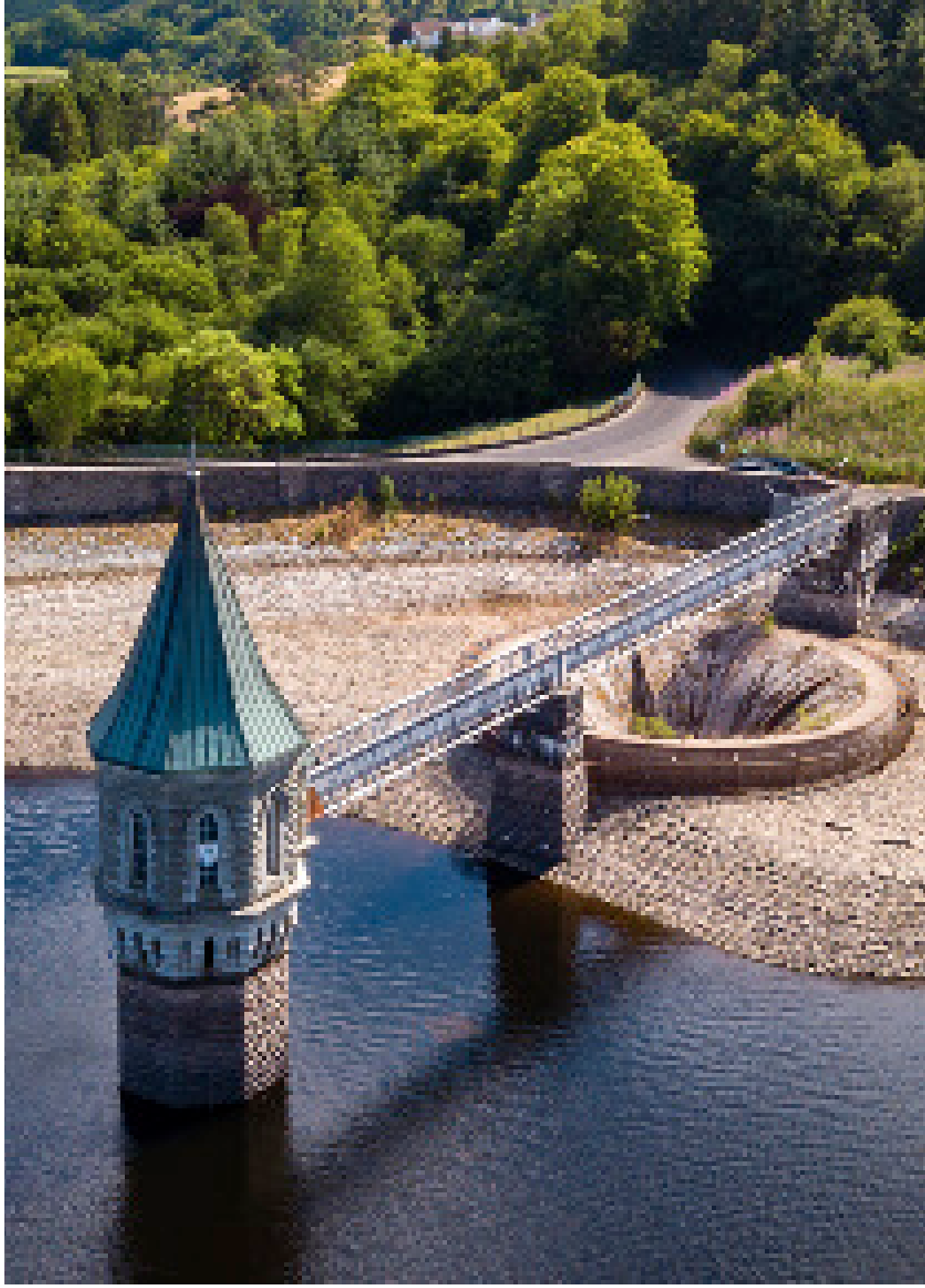
UK WATER REUSE ASSOCIATION

About us

The UK Water Reuse Association was formally the UK Rainwater Management Association. With significant amounts of industry momentum in recent years, our members decided that the time was right have a re-fresh of our look and feel. We believe our new name and look will propell us into the exciting future of water reuse!

Although our name has changed, our unwavering commitment to supporting our members has remained consistent. The recommendations and perspectives included in this briefing note represent over three decades worth of technical experience in the water reuse industry by our members.

Having established as a leading voice in the water sector in 2004 by manufacturers, we are proud to be an organisation which advocates for water reuse and addresses the risks at the same time.



Executive Summary

This document proposes a roadmap to HM Government for the mandatory introduction of water reuse in the UK by 2030. This summary outlines the structure of this report including the context, current legislative barriers, and key recommendations.

Need for action

The timing of mandating such technologies is critical. The UK's water infrastructure is facing significant challenges from climate change, growing demands, and aging utility assets.

New housing development targets will place even greater demand on an already "seriously stressed" water network, with an additional 5,000 megalitres of water needed daily to meet demand by as early as 2050. Incorporating water reuse in all new builds can save 1,025 megalitres daily by 2050. This is equivalent to 20.5% of the predicted national water deficit but only if action is taken now.

Currently, most UK buildings use water in an inefficient way; a single public water supply entering the building serving potable and non-potable outlet. Water reuse is proven to be a safe and efficient method of generating alternative water resources for use in non-potable applications, allowing public water supplies to be reserved for drinking and hygiene.

Water reuse systems in this context refers to rainwater harvesting (RWH), greywater recycling (GWR), and combined solutions for reclaiming water on a site-by-site basis for supplying non-potable applications. Water reuse is applicable to both residential and non-residential settings.

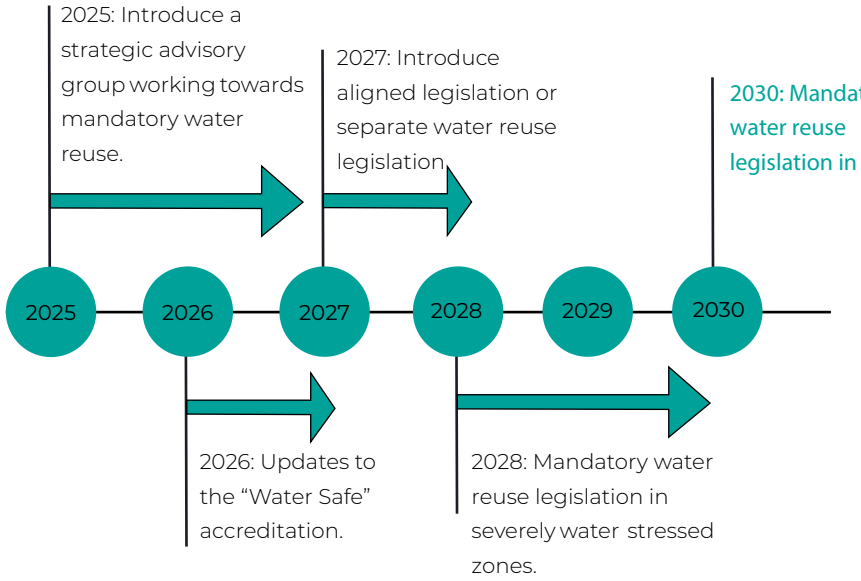
Water Reuse can save 1,025 megalitres per day by 2050.

Legislative Environment

The current legislative environment is limiting the growth of the sector. Compared to other leading economies, the legislative environment is limited to product standards (BS EN 16941) with no clear legislative framework currently existing. Furthermore, many of the legal frameworks which govern water supply authorities pre-date the period when water reuse became a viable technology in the UK marketplace.

Section 68 of the Water Industry Act 1991, and Regulation 4 of the Water Supply (Water Quality) Regulations 2016 currently only permit "wholesome" water to be supplied by water supply authorities, preventing ownership and stewardship of water reuse systems by water companies. These regulations, in addition to Part G of the Building Regulations 2010, will need to be amended.

Recommendations



Need for Action

Years of inaction on water scarcity has resulted in a limited window for change. Sir James Bevan, Former CEO of the Environment Agency stated in 2019 that we are "looking into the jaws of death if we do not act now on water". As a viable and available solution, we believe water reuse offers the opportunity to help us significantly reduce the national water deficit which is predicted by 2050.

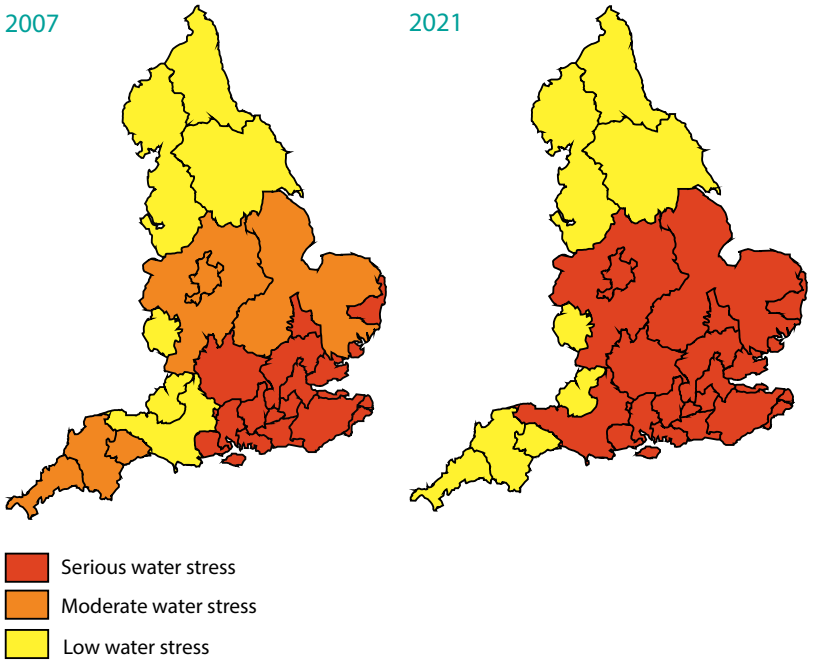
In 2020, the National Audit Office stated "water shortages are an inpending risk to the UK", yet little progress has been made until now. Many of our regions are already considered 'seriously water stressed' by the Environment Agency; the most serious classification given to regions where demand for water is close to outstripping available supplies. The situation is so serious that parts of West Sussex are now considered 'water neutrality' zones where water use on new developments is heavily restricted, limiting the local economy.

Considering targets to build 1.5 million homes over the next 5 years, and the growing need for non-domestic properties, we are calling on the government to introduce mandatory water reuse in seriously water stressed regions by 2028, with mandatory legislation covering all regions of the UK in place by 2030.

Timing is of the essence. Water reuse is best implemented at new build stage and is difficult to retrofit. Research carried out by Ricardo highlights retrofit costs are 50% more due to the complexities around altering pre-installed drainage layouts.

Water Reuse can only help us to meet 20.5% of the national water deficit by 2050 if we act now and start installing RWH and GWR systems on mass. The next section of this briefing note details the water saving potential of water reuse.

Environment Agency "Water Stress" Map - England



5 Billion litre daily National Water Deficit by 2050

Need for Action

Forecasts show widespread uptake of water reuse systems can have a significant impact on reducing domestic and non-domestic water usage in the UK assisting with improved water resource management.

Domestic

Calculations are based on performance bands for water reuse determined by the Future Homes Hub "Water Ready" report which states a saving of 25 Litres per person per day (LPPPD) can be achieved through reclaimed rainwater and greywater. Considering this against the Department for Communities and Local Government Census which states an average of 2.4 occupants per home, and based on a realistic construction figure of 250,000 homes per year, this provides an accurate saving figure for domestic use.

Modelling for domestic properties highlighted a daily saving of 375 megalitres in 2050 if every new home built from 2026 includes RWH or GWR. The savings will unlock available water supplies for 1.9 million homes

Non-Domestic

Non-domestic calculations for water reuse have used data from the Ricardo report which highlights an average of 2,600 non-domestic properties are constructed each year. Considering this number against an average daily water reuse saving of 10m3 in commercial properties, an accurate modelling format has been achieved.

Modelling for non-domestic properties highlighted a daily saving of 650 megalitres if every new large non-domestic property built from 2026 includes RWH and GWR. Collectively, these combined savings can achieve a daily saving of 1025, equivalent to 20.5% of the national water deficit by 2050.

Domestic

Number of properties by 2050:
6,250,000

Total daily saving by 2050:
375 Megalitres

Non-Domestic

Number of properties by 2050:
65,000

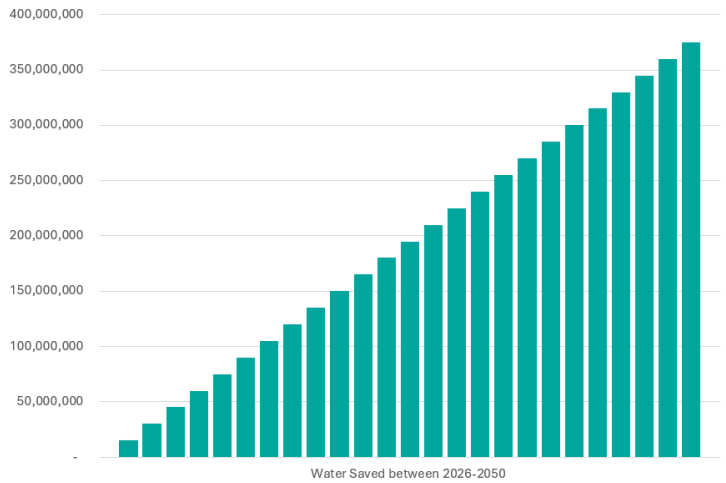
Total daily saving by 2050:
650 Megalitres

Combined

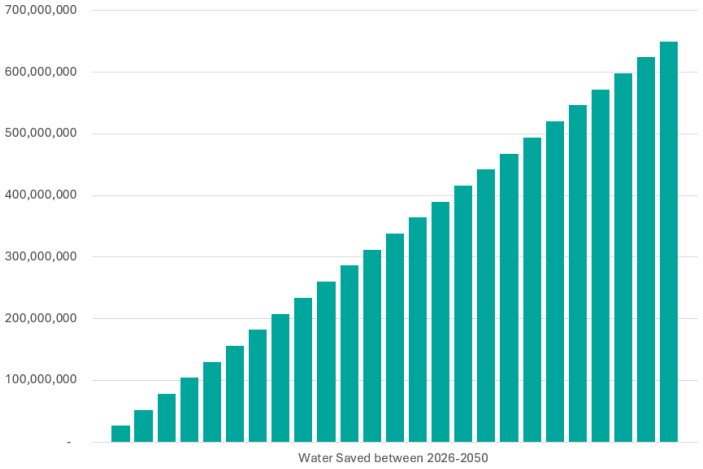
National Water Deficity:
5,000 Megalitres

Total daily saving by 2050:
1,025 Megalitres

Water Reuse Savings from domestic properties 2026 - 2050 (litres)



Water Reuse Savings from non-domestic properties 2026 - 2050 (litres)



Biodiversity & Flooding

Combined Sewer Overflows

In line with the recent Water (Special Measures) Bill, water reuse can assist with the "clean up" of the water industry by reducing the number of combined sewer overflows. Retaining water locally on site for reuse can alleviate capacity in the combined sewer network.

Water reuse is considered a core pillar of reducing storm water discharge rates in the CIRIA "Sustainable Urban Drainage Manual" and will enable developers to achieve mandatory sustainable drainage requirements when Schedule 3 amendments to the Flood and Water Management Act is implemented in England.

Biodiversity Net Gain

Improving our natural environment is a core aim of the recently introduced Biodiversity Net Gain requirements for developers. Water reuse can also assist with meeting this mandatory requirement by reducing the volume of water abstraction from natural aquifers, enabling that water to be saved for habitats.

Recent testing in the Arun Valley by Natural England determined over-abstraction of water from natural aquifers could have been adversely impacting natural habitats in the area. This position statement resulted in local authority introducing Water Neutrality restrictions on new applications, where water reuse is necessary for reducing abstraction.

Carbon Emissions

Water reuse offers significant savings on carbon emissions when compared to mains water supplies. Life Cycle Assessments (LCAs) of 125 water reuse installations across the UK identified substantially lower CO_2 emissions when relying on reclaimed water. The LCAs were carried out under the Ricardo report.

UK Regulatory Barriers

Timing for action is limited and regulatory changes are required to ensure water reuse can be installed on mass in the UK. The below regulatory barriers will be required to change before a single, unifying piece of legislation mandating the use of water reuse can be introduced.

1. Section 68 of the Water Industry Act 1991 and Regulation 4 of the Water Supply (Water Quality) Regulations 2016 and the Water Fittings regulations, to be revised regarding the definition and permitted use for non-wholesome/ wholesome water, allowing water supply authorities to provide and adopt water reuse systems for professional ongoing maintenance and stewardship.

2. Section 218 of the Water Industry Act 1991 to be revised regarding the definition of "domestic" water consumption, enabling water supply authorities to provide a reclaimed water supply for specific "sanitary purposes" including "toilet flushing" and "laundry".

3. Part G of the Building Regulations 2010 is updated to ensure water reuse systems are mandated for all new buildings and major refurbishment projects. Minimum sizing requirements offering clear guidance for designers and installers for the storage of rainwater and greywater will be detailed in line with the already established British Standard BS EN 16841.

International Examples

Many leading economies are already promoting or mandating the use of RWH and GWR systems. The current UK legislative environment is unfavourable to water reuse and we are at risk of falling behind other economies already embracing water reuse strategies.

Australia

The regulatory environment for water reuse in Australia is much more favourable to enabling implementation. Clear legislative guidance has resulted in RWH systems providing 177 billion litres of water, accounting for 9% of the total residential water use in the country.

Thanks to clear guidance, 1.7 million properties now have rainwater harvesting installed. National guidance within Part B6 of the National Construction Code outlines the performance requirements for designers and installers at a national level; whereas; at a region level, many areas of the country, including New South Wales, now mandate the use of rainwater harvesting and even legislate for minimum storage volumes and catchment areas. Australia is a successful example of where clear legislation on water reuse has enabled central government to successfully reduce water demand.

Germany

Clear guidance on the required performance specifications of reuse systems, opportunities for financial returns on reduced surface water charges, and financial subsidies for installing systems has resulted in high uptake of water reuse in Germany. One third of all German buildings now have RWH installed.

The European Drinking Water Directive offers clarity for developers. The directive states any water which is not used for drinking or bodily hygiene can be replaced with a reclaimed supply of non-potable water. The guidance helpfully details minimum requirements for water reuse, particularly relating to irrigation purposes.

Belgium

Since 2004, mandatory rainwater harvesting for new buildings and major renovation projects in Belgium (Flanders) has enabled a significant decreased of mains water through rainwater for non-potable purposes. Since legislative changes in July 2022, rainwater reuse has through new legislative changes (Blue Deal) in July 2020, rainwater reuse was further pushed to increase from 4 to 8m3 million litres per day.

Clear legislative guidance was introduced as part of the "Blue Deal" which sought to improve resilience to climate change. These changes clearly signal the positive impact mandatory legislation can have on water resources.

France

Closer to home, French legislators have recently introduced new legislation as of July 2024 to promote the use of water reuse for non-potable purposes. The R. 1332-94 of the Public Health Code covers the design, quality parametres, commissioning, and maintenance of reuse systems to offer clarity for developers and installers.

South Africa

There are examples globally of where water reuse has been dettered through preventative legislation, resulting in worsened water resource management. South Africa is one example of where rainwater harvesting is illegal under their National Water Act.

Water scarcity is so severe in the country that 35% of the water supply is lost to unauthorised connections to the public water supply network. Greater reliance on RWH and GWR would enable homes and businesses to reduce their reliance on public supplies.

In conclusion, many other countries are working on equal implementation strategies to ensure water reuse becomes widespread in their respective countries.

Opportunities for UKPLC

- Support UK-based businesses to grow, enabling more sustainable, long-term jobs.
- Be a global leader in sustainable water management.
- Elevate Water to have equal importance as Energy & Carbon.
- Champion the continued growth of the built environment sector in water neutral areas of the UK.
- Boost growth of UK based SME's in the manufacturing and maintenance sectors.

Mitigating Risk

Water reuse is a safe, proven method of providing additional water resources in the UK. There are a number of risk mitigation measures already in place to ensure safety and compliance across the industry. These include...

1. BS 16941 is a long-established product standard which details the minimum performance levels of RWH and GWR systems, including providing sufficient protections on the mains water backup functions to prevent cross-contamination on this function.

2. WRAS Information and Guidance Note 9-02-05 outlines the necessary pipework and labelling requirements for the suitable identification of reclaimed water sources for installers and designers.

3. Part G of the Building Regulations 2010 requires all systems supplying reclaimed water supplies to have a full risk assessment to be carried out to prevent "waste, misuse, undue consumption, or cross-contamination of the wholesome water" by the manufacturer or installer.

4. Water Reuse Association members are committed to the integrity of the reclaimed water supply and as such ensure every system receives full commissioning sign-off before operation of the system commences.

All these mitigating measures are already established. The next phase of risk mitigation should ensure that effective communication and awareness in the installer community exists surrounding these regulations. As recommended, in the roadmap in the next section, inclusion of water reuse in the "WaterSafe" accreditation would aid this transition further.

Recommended Roadmap

2025: Introduce a Strategic Advisory Group working towards mandatory water reuse in the UK

This group will support collaboration between stakeholders and government departments to align everyone's needs and prioritise the water reuse agenda. The Water Reuse Association to be included as a technical advisor to the working group.

2026: Updates to the "Water Safe" accreditation

Inclusion of dual pipework infrastructure and water reuse systems to become a new module within the accreditation to aid awareness and education.

2027: Introduce aligned legislation or separate water reuse legislation

Amend the following legislation to facilitate water reuse...

- Water Supply (Water Fittings) Regulations 2016
- Water Supply (Water Quality) Regulations 2018
- Private Water Supply Regulations 2018
- Building Regulations 2010
- Water Industry Act 1991

2028: Mandatory water reuse legislation in severely water stressed zones

A single unifying piece of legislation mandating the installation of water reuse systems in the most water stressed zones of the UK.

2030: Mandatory water reuse legislation in all areas of the UK

As above, but covering the whole of the UK to aid with reduced reliance on public water supplies and lowered storm water discharge rates.