



National Audit Office

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## **Report**

by the Comptroller  
and Auditor General

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**Department for Environment, Food & Rural Affairs**

# Water supply and demand management

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Department for Environment, Food & Rural Affairs

# Water supply and demand management

Report by the Comptroller and Auditor General

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Gareth Davies  
Comptroller and Auditor General  
National Audit Office

18 March 2020

This report examines the effectiveness of Defra's oversight of the industry and how it provides direction to regulators and companies to secure long-term resilience in the water supply.

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## Key facts

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**14bn litres**

daily demand for water in England and Wales in 2018

**20%**

proportion of water lost to leakage, equivalent to 3 billion litres each day

**4bn litres**

additional water supply needed per day by 2050 to counter the growing risk of drought from climate change

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**1.08 billion** litres per day of supply lost by 2045 to climate change and the need to restore abstraction to sustainable levels

**4%** proportion of water supplied by trading between water companies

**£469 million** value of fund established by Ofwat in July 2019 to allow water companies to work together to develop strategic water resource solutions

**16%** reduction in leakage Ofwat expects water companies to achieve between 2020 and 2025

**12%** average reduction in consumer bills that Ofwat expects by 2025

**143 litres** average daily consumption of water per person for England in 2018-19: this has increased each year since 2014-15

# Summary

## Introduction

**1** Water shortages are an impending risk for the UK. Parts of the country face a significant risk from drought, while neighbouring regions have surplus water. In its 2017 climate change risk assessment, the Committee on Climate Change highlighted shortages in water supply as one of five priority climate change risks that needed stronger policies and urgent action. Research commissioned by the Committee estimated the demand for water in England will exceed supply by between 1.1 billion and 3.1 billion litres per day by the 2050s, depending on the extent of climate change and population growth.

**2** The Department for Environment, Food & Rural Affairs (Defra) has overall responsibility for setting the policy and regulatory framework for water in England. Its policy has one overarching objective: “to ensure clean and plentiful water”. It expects water companies to provide resilient water supplies supported by robust water resource management plans. To deliver this, it oversees a complex delivery landscape of multiple regulators and privately owned water companies. The Water Services Regulation Authority (known as Ofwat) regulates the water services that the water companies provide, with the role of ensuring consumers get value for money. It also has a statutory duty to further resilience and consumer interests. The Environment Agency (EA) regulates abstraction licences to ensure that abstractors do not impinge on other abstractors’ rights and leave enough water for environmental needs. The government’s objectives and the delivery landscape are described in more detail in Part One.

**3** Water companies are responsible for developing and maintaining an efficient and economical system for providing secure water supplies to consumers and are required by statute to set out how they intend to balance supply and demand over the next 25 years through a water resource management plan. The companies must identify all the options available to them and show how they have decided which options to take forward. In its 2019 report to Parliament, the Committee on Climate Change was positive about the public water supply infrastructure planning system, stating that the water resource management plans set out how water companies have committed to more ambitious targets and considered options for new water supply infrastructure. In their plans, water companies forecast what future demand and supply would be if they took no action. These forecasts show that total demand would start to exceed supply in 2034-35.

**4** In parallel to the water resource management planning process, Ofwat carries out a review every five years based on business plans submitted by each water company. In their business plans, water companies seek agreement for the level of funding needed to implement their water resource management plans. Ofwat's review determines the price and service package water companies must deliver. In doing so, Ofwat must balance consumers' interests with the need to ensure companies can finance the delivery of water services and to meet other legal obligations, including their environmental and social responsibilities. Ofwat sets the price controls for water companies every five years. In December 2019, it published the outcome of its price review for 2019, setting price controls for water companies for the period 2020 to 2025.

**5** The gap between supply and demand can be tackled through a variety of measures for increasing supply and reducing demand. The most significant contribution between now and 2045 is expected to come from leakage management, which is due to contribute additional supply of more than one billion litres per day. Currently, nearly three billion litres of water (20% of the total supply) are lost through leakage each day.

### **Scope of this report**

**6** In this report, we set out the challenges facing the water industry in England and assess how Defra is tackling them through its oversight of water regulators and the water companies. The report is both retrospective, looking at how effectively the government has achieved its objectives up to now, and forward-looking, examining how prepared it is for the greater challenges it faces in the future as a result of climate change and population growth.

**7** In Part One, we set out the policy and delivery landscape that governs how water is delivered in England and assess how effectively Defra uses its influence to deliver its strategic policy objectives. In the following parts, we assess how well the government is delivering its key objective of improving the resilience of the water supply by setting the framework for water companies to increase supply (Part Two) and reduce demand (Part Three). Our methodology is set out in Appendix One.



## Key findings

The overall system for managing water resources

**8 The government is not yet able to reliably forecast total water demand as water resource management plans only cover the public water supply.** Water companies' current supply and demand forecasts only give a partial picture of overall water resources as nearly half (49%) of freshwater abstraction is outside the public water supply. This is mainly water abstracted directly for use in the power sector, for agriculture, and by industry. Abstraction is the process of taking water from ground or surface water bodies. Like the water companies, these other water users must obtain licences from the EA but have not been included in the water companies' resource forecasts. Water companies will now be required to engage with these other users as part of a new national framework drawn up by the EA, enabling a wider understanding of total water need, but most companies have little experience of doing so (paragraphs 2.3 and 2.4).

**9 Defra does not provide guidance for water companies on the different types of intervention available to improve the resilience of the water supply.** Defra's role in the water resource management process is to provide strategic direction, and the Department publishes guidance on the methodology water companies should use for option appraisal, but it does not offer advice or guidance on different types of intervention or facilitate the sharing of good practice between water companies. In other policy areas, Defra recognises the value of a central government supporting role. For example, it has a policy objective to gather evidence and develop options to inform its future flood and coastal risk management investment programme. Defra believes this is appropriate as the floods programme is largely publicly funded, whereas it is for water companies, as private entities, to make their own investment decisions, considering all the options available to them. However, this does not need to preclude Defra providing useful guidance and, in 2015, the EA advised Defra that work was needed to provide a clear evidence base to support the water planning process and that a lack of knowledge of the costs and benefits of actions to mitigate water shortages was a barrier to progress (paragraph 1.15).

**10 There is a risk that the fixed-term planning cycle could delay potential improvements in water companies' performance.** The five-year cycle has the advantage of providing certainty to investors, companies and their customers. However, more urgent action may sometimes be needed to improve system resilience. Defra expressed an ambition in 2016 to minimise leakage, a significant change from its 2013 position that water companies should balance their efforts to reduce leakage against their impact on customer bills. Despite this shift in Defra's position, leakage has remained at roughly the same level since the start of the five-year planning cycle in 2014-15 before more ambitious targets come into force in 2020. Ofwat told us that it was not aware of evidence that imposing revised performance commitments in the middle of a planning cycle would have resulted in meaningful gains sufficient to outweigh the potential destabilising impact of doing so. However, it is considering whether to take some performance issues out of the price review cycle, either to develop longer-term processes where appropriate, or to facilitate more rapid action where there are acute performance issues or more urgent policy imperatives. The Office of Gas and Electricity Markets (Ofgem) oversees a similar price control for electricity networks and is looking to adopt dynamic targets that are updated throughout the price control period as new evidence emerges (paragraphs 1.21 to 1.24).

**11 Water companies have found it difficult to determine what level of infrastructure investment the government will deem acceptable.** Ofwat scrutinises companies' investment proposals and considers the need for and efficiency of company proposals through the price review process, setting prices and its system of incentives accordingly. Neither Defra nor Ofwat has an explicit policy to reduce prices, and water companies told us that the government had not provided a sufficient steer on how to balance the need for investment with maintaining affordable bills, particularly where they have evidence that their customers are prepared to pay more to finance infrastructure investment. In December 2019, Ofwat reported that it expects household bills to fall by 12% before inflation over the five-year period 2020–2025. Ofwat also announced that it expected water companies to increase investment over the period by reducing the return on capital it allowed them and challenging them to increase their efficiency (paragraphs 1.18, 1.25 and 1.26).

## Increasing the supply of water

### **12 Total water supply is forecast to decrease by 7% by 2045 as a result of climate change and the need to reduce abstraction to restore sustainability.**

Almost all the water in the public water supply is obtained through abstraction from ground or surface water sources but abstracting too much water can lead to physical changes that reduce biodiversity. Reducing unsustainable abstraction is a key objective in the government's 25-Year Environment Plan and the EA is currently reforming its licensing strategy, with a focus on restoring sustainability. A reduction of 480 million litres per day is needed nationally by 2045 to restore existing abstraction to sustainable levels. Drier weather is forecast to further reduce supplies by 600 million litres per day. Water companies only expect a modest supply increase through new abstraction, which means that nationally the total amount of water sourced each day through abstraction is set to decline by 1.08 billion litres over the next 25 years, and water companies will need other measures to ensure resilience in the water supply (paragraph 2.7).

**13 Bulk water transfers are a major part of water companies' plans but the government is only now starting to address barriers to progress.** In 2008, the government instructed water companies to consider the full range of options for sharing water resources with other companies, including bulk transfers, but these still only make up 4% of total water supply (600 million litres per day). Water companies plan to use them to increase supply by more than one billion litres per day by 2045. Ofwat introduced financial incentives for transfers in the 2014 price review but reported disappointing progress to the Environment, Food & Rural Affairs Select Committee in 2018. There are still significant barriers to investment: transfers are technically challenging, present planning difficulties and require water companies to work together. The government is now only at the early stages of identifying and addressing these barriers. In July 2019, the regulators set up a joint initiative to seek to remove regulatory barriers to infrastructure investment and established a fund of up to £469 million to allow companies to work together to investigate and develop strategic water resource solutions. This is expected to enable companies to develop solutions that are ready to start construction by 2025 (paragraphs 2.13 to 2.17).

**14 Other means to source more water require significant investment by water companies and are energy-intensive.** Abstraction is the cheapest way for water companies to source water. Another significant way water companies can add to total supply is through desalination, a process that turns seawater into drinking water. Currently, desalination is energy-intensive and plants are costly to build. Thames Water currently has the only desalination plant in England, but it has been beset by long-term operational issues. Although total water supply is set to decline nationally, the severity of water shortages varies over time and by region. Connecting regions with surplus to regions of deficit and storing water in reservoirs during times of the year when water is more plentiful are effective ways to boost resilience without increasing total supply. Both options require significant investment by water companies and do not easily fit within Ofwat's five-year price review cycle because of the time needed for construction. At the end of 2019, Ofwat agreed to a proposal from Portsmouth Water to construct a reservoir to serve customers of Southern Water, the first reservoir to be built in the south-east since the 1970s (paragraphs 2.8 to 2.12).

#### Reducing the demand for water

**15 Defra has yet to announce a target for personal water consumption despite a commitment to do so by the end of 2018.** In its 25-Year Environment Plan, published in January 2018, the government undertook to work with industry to determine appropriate targets for water companies for the average personal water consumption of their customers and the measures needed to achieve them. In 2018-19, average domestic water consumption rose to 143 litres per person per day, an increase of 3% since 2014-15. Ofwat reported in June 2018 that some companies' ambitions in this area were "modest", and this was particularly the case for companies with already high consumption rates. Defra launched a consultation on measures to reduce personal consumption in July 2019, but this did not specifically solicit views on ways to work with industry to set a target (paragraph 3.5).

**16 The government has relied on water companies to get its message across about the importance of reducing water consumption.** Water companies have a statutory responsibility to promote the efficient use of water resources to their customers. They include advice to consumers with their bills and in social media, but there is no evidence this has any impact on consumers' behaviour, and average consumption continues to rise. Defra's July 2019 consultation urged water companies to be more ambitious and sought views and evidence on measures that could be taken forward to reduce personal water use, such as compulsory water metering. Nevertheless, there is little public awareness of the need to reduce personal consumption or understanding of how to do so. In July 2019, a group of organisations, including the EA and Water UK, the trade association for water companies, launched the 'Love Water' campaign to raise awareness of the importance of water and the need to protect it but, other than a Twitter feed, there has been no further activity since its launch (paragraphs 3.22 to 3.25).

**17 The government has not succeeded in its attempt to reduce non-household water consumption through increased competition.** Defra has relied mainly on the business retail market, launched in April 2017, to reduce non-household water usage. It is designed to allow non-household customers to choose the water company they want to deliver their water services. Ofwat expected it would deliver a modest 2% water efficiency saving, as new retailers would offer customers advice and support on water efficiency measures, but it does not know if these savings have been achieved. Awareness of the market and take-up have been lower than anticipated. In July 2019, almost half (47%) of eligible businesses, charities and public sector organisations were unaware of the market and only around 3% switched or renegotiated a deal during 2018-19, a similar figure to the previous year. Hardly any organisations said they received water efficiency advice or leakage control services as part of their package. Defra told us that Ofwat and the EA intended to write a joint letter to retailers in March 2020 to encourage further efforts on this (paragraphs 3.12 to 3.15).

**18 Defra has not been sufficiently influential to ensure water efficiency is a priority across government.** As the policy lead on water resources, Defra should ensure that it is effectively influencing other public bodies and departments to reduce their own water consumption and introducing wider policies that could impact water consumption:

- The Greening Government Commitments set out the actions government departments and their agencies will take to reduce their impacts on the environment, including water use reduction, but these do not apply to local authorities and other public buildings that are major consumers of water. Defra could work more with departments such as the Department of Health & Social Care and the Department for Education to encourage water efficiency in hospitals and schools (paragraph 3.16).
- Other government departments have policies that could have a major impact on water consumption, for example building and planning regulations, product labelling and product standards. Energy efficiency has been embedded in each of these, but water efficiency is yet to be regarded in the same way. Defra told us it is starting to work with other government departments to explore how water can be given greater prominence within building and planning regulations, product labelling and product standards and is using the responses from its July 2019 consultation on reducing water consumption to help shape this work (paragraphs 3.17 to 3.21).

**19 Water companies' plans to tackle leakage are ambitious but there is a risk of them not being achievable.** In the most recent price review, Ofwat challenged water companies to reduce leakage by at least 15% in the period 2020 to 2025. However, half of the water companies presented initial water resource management plans that failed to meet this challenge, and Defra put pressure on them to increase their ambition. As a result, most companies signed up to reduce leakage by 15% or more, which meant that several companies committed to leakage reduction levels that were more than double their original targets. Ofwat acknowledged that, for some companies, meeting the revised targets will rely on adopting as yet unknown or untested approaches (paragraphs 3.8 and 3.9).

## **Conclusion on value for money**

**20** Tackling water resource issues is one of the five priority risks the Committee on Climate Change identified in its 2017 climate change risk assessment. If more concerted action is not taken now, parts of the south and south-east of England will run out of water within the next 20 years. Reducing demand is essential to prevent water shortages as water companies are running out of low-cost options for increasing water supply. Defra has left it to water companies to promote the need to reduce household water consumption, and yet it continues to increase. Defra committed to announcing a personal water consumption target by the end of 2018 but has not yet done so, while the introduction of the business retail market has not led to the expected reductions in non-household water usage.

**21** Water companies' long-term progress on tackling leakage and reducing water consumption has stalled over the past five years, and companies are only now starting to develop bulk water transfer solutions at the scale required. The government has been grappling with these issues for more than a decade but rapid progress is now vital for Defra to deliver on its objective of a resilient water supply. Defra has taken positive steps to give a more strategic focus to water resource planning. But it must make sure that its new national framework and Ofwat's new funding for companies to develop strategic solutions produce the collaboration and prompt action from water companies that is now needed. Defra will not be able to achieve value for money unless it provides stronger leadership across government, and a much clearer sense of direction to water companies, the water regulators and water consumers.

## **Recommendations**

**22** Defra should build on the steps it is already taking through the national framework, and:

- a** provide guidance for water companies and facilitate sharing of information between them to support them in improving long-term resilience;
- b** fulfil its commitment to set a target for water companies for average personal water consumption;
- c** consider ways of promoting the need for water efficiency more coherently to ensure there is a coordinated and credible message, and develop plans to monitor and evaluate the impact of existing and new awareness-raising activities;
- d** review the business retail market to identify barriers to achieving improvements in water efficiency and how to overcome them;

- e** identify all opportunities to influence and work with other government departments to reduce usage by hospitals, schools and other large public sector users, and influence policies that have an impact on water consumption and long-term resilience; and
  - f** provide a stronger steer to Ofwat and the water companies on the expected levels of investment by water companies, informed by better and more consistent evidence on customers' willingness to pay, commissioning new research, if necessary.
- 23** Defra, Ofwat and the EA should:
- g** regularly review water companies' progress during the coming planning cycle on tackling leakage and reducing consumption, and ensure that water companies have robust contingency plans ready if progress is slower than anticipated; and
  - h** review the business and resource management planning processes to ensure the need for a long-term strategy and targets does not cause delays to potential improvements in water companies' performance.

# Part One

## The overall system for managing water resources

**1.1** In this part of the report we set out the policy and delivery landscape that governs how water is delivered in England and assess the leadership shown by the Department for Environment, Food & Rural Affairs (Defra) and how effectively it uses its influence to deliver its strategic policy objectives.

### **The scale and nature of the problem**

**1.2** Water shortages are an impending risk for the UK. Water resources are already stretched in some parts of the country, especially in the drier and more densely populated south-east (**Figure 1**).

**1.3** In its 2017 climate change risk assessment, the Committee on Climate Change (CCC) highlighted shortages in the public water supply as one of five priority climate change risks that needed stronger policies and urgent action. Research commissioned by CCC estimated that the demand for water in England will exceed supply by between 1.1 billion and 3.1 billion litres per day by the 2050s, depending on the extent of climate change and population growth. However, it identified an urgent need for longer-term water resource planning, more coordinated action to ensure resilient supply and further steps to achieve the reductions in consumption and leakage that are likely to be required.

**1.4** Demand for water is about 14 billion litres per day in England and Wales. With further population growth expected, particularly in the south and east of England, and the effects of climate change, there is increasing pressure on the public water supply. By the 2050s, total UK demand for water is projected to have increased by between 2% and 9%, while the amount of available water is expected to have declined by between 6% and 11%. In its 2019 report to Parliament, the CCC reported that “more can and needs to be done to reduce consumption and leakage further and faster, to manage the risks from reduced water availability in the future”.

**1.5** In April 2018, the National Infrastructure Commission concluded that simply maintaining England’s current level of drought resilience in 2050 would require an additional three billion litres of water per day. Given the growing risk of severe droughts, it recommended that the government should aim to boost water capacity by four billion litres per day by 2050, an increase of more than 25%. It called for increased resilience to drought through a national water network, halving the water lost through leakage, and reducing demand through smart metering.



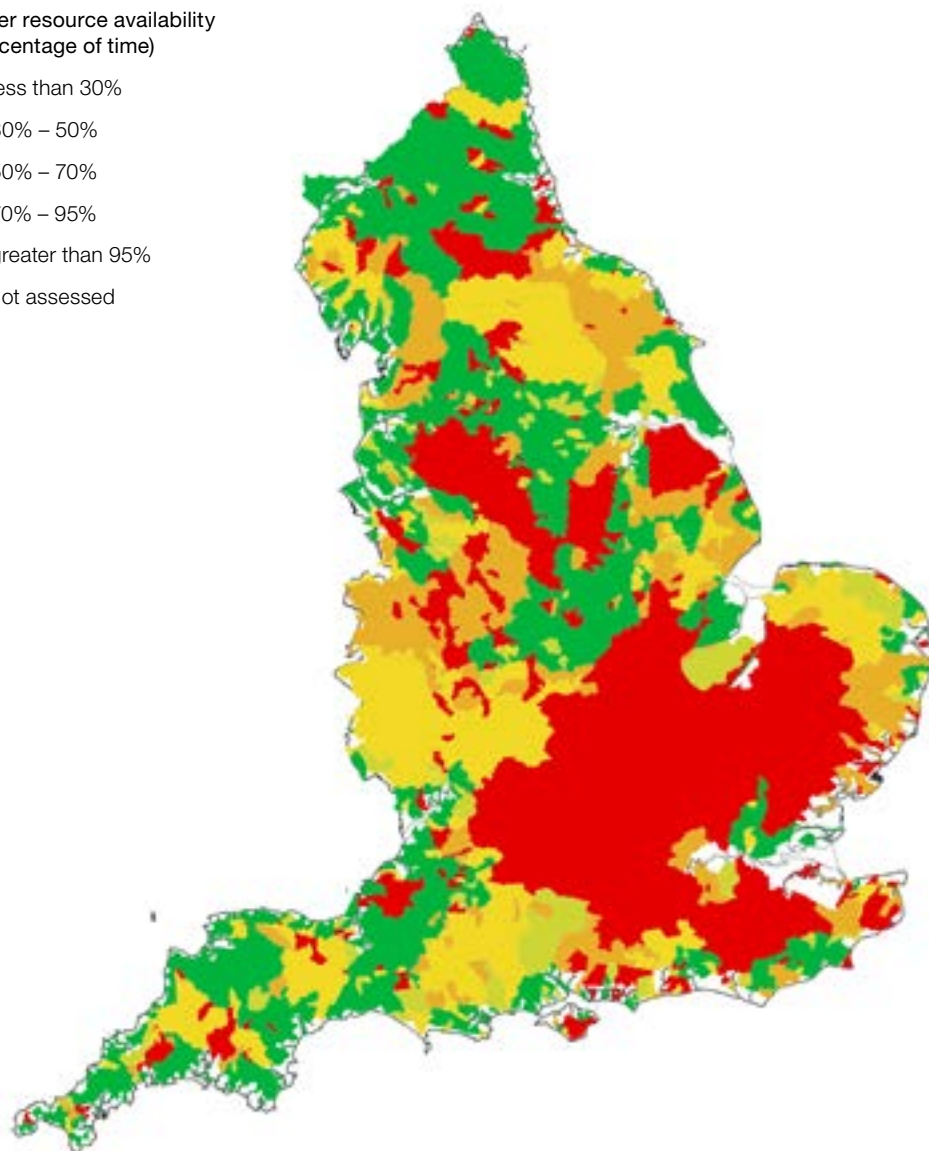
**Figure 1**

Proportion of the year when water could be taken sustainably from the environment in England in 2019

Water resource availability is lowest in the east and south-east of England. Additional resources are available less than 30% of the time in many parts of the country

Water resource availability  
(Percentage of time)

- less than 30%
- 30% – 50%
- 50% – 70%
- 70% – 95%
- greater than 95%
- not assessed



**Notes**

- 1 Water resources availability is considered for consumptive abstraction.
- 2 Availability is the percentage of days during the year additional water resources can be taken sustainably from the environment.

Source: Environment Agency abstraction data

**1.6** Water companies, which are responsible for providing services to consumers and maintaining their networks to provide these services in the future, are required to set out how they intend to balance supply and demand over at least 25 years through the statutory water resources management planning process. In its report to Parliament in 2019, the CCC scored the progress of public water supply infrastructure in preparing for the impacts of climate change highly (rated 8 on a 9-point scale). It commended the planning system for getting water companies to commit to more ambitious targets and to consider options for new water supply infrastructure.

**1.7** **Figure 2** sets out water companies' projections for supply and demand until 2044-45. The 'baseline' projection, which represents predicted supply and demand if water companies do nothing to address the deficit, indicates that demand will start to exceed supply in 2034-35.

**1.8** The government expects water companies to tackle this deficit through a 'twin-track' approach of measures for increasing supply and reducing demand (**Figure 3** on page 18), ensuring enough resilience to withstand a severe drought event (one in 200 years) by 2030. Based on current water company plans, the most significant contribution is expected to come from leakage management, which is due to contribute to reducing the daily deficit by more than 1 billion litres by 2045.

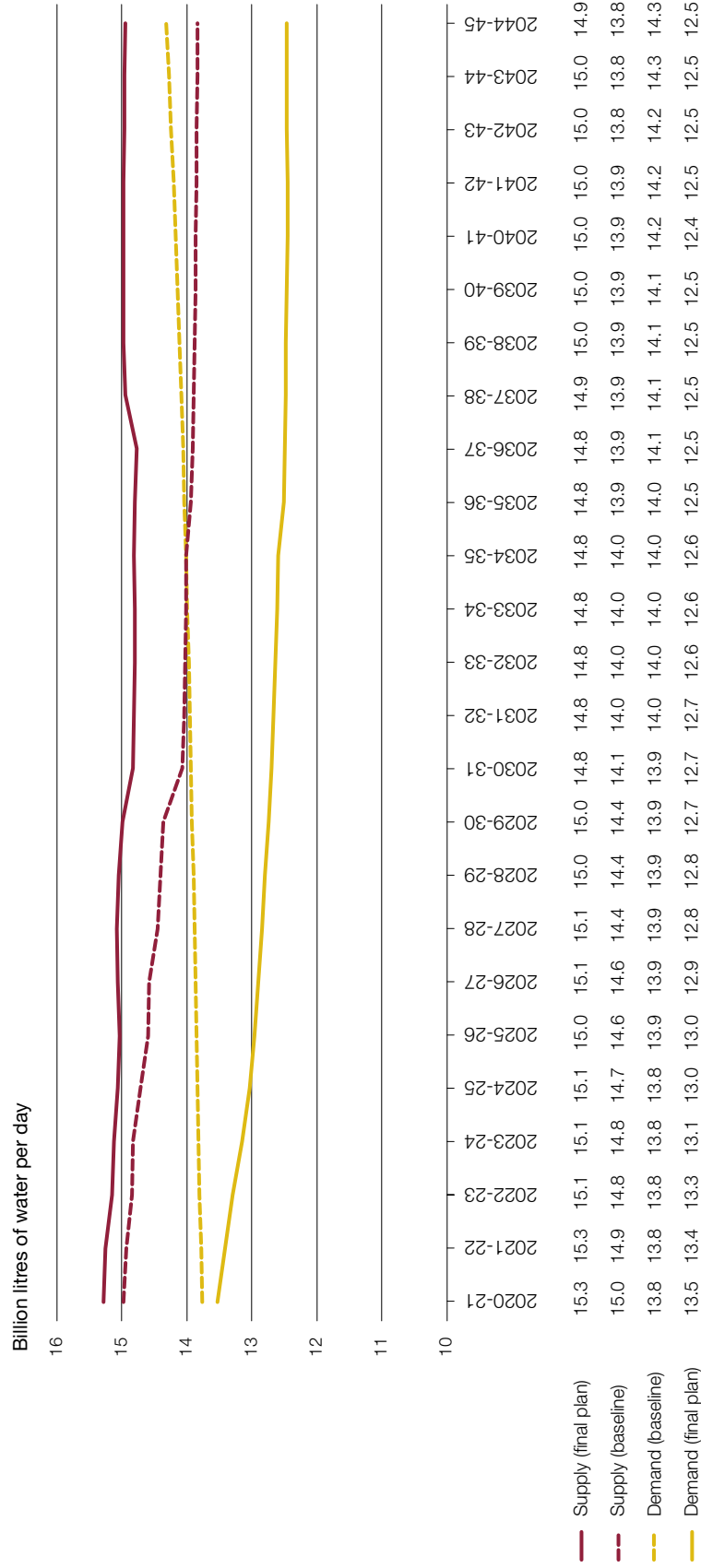
### **The bodies involved in managing water resources**

**1.9** Defra has overall responsibility for setting the policy and regulatory framework for water in England. Its policy has one simple objective: "to ensure clean and plentiful water". Defra's single departmental plan sets out how it intends to achieve this by:

- working with industry to deliver the Water Industry National Environment Programme actions by 2025 (see paragraph 2.6);
- maintaining environmental protection through preventative action to avoid deterioration of the water environment and reversing deterioration when it occurs;
- ensuring resilient, sustainable, affordable water services to homes and businesses, through a strategic framework for water sector planning and investment, and a strengthened regulatory framework; and
- working with the Water Services Regulation Authority (known as Ofwat) to deliver agreed outcomes from the 2019 price review, ensuring the water industry works as hard for the environment and customers as it does for its investors, strengthening Ofwat's powers to hold the industry to account if needed.

**Figure 2**  
 Baseline and final plan scenarios for supply and demand for water across water companies in England from 2020-21 to 2044-45

If water companies do nothing, their forecasts show supply will start to exceed demand in 2034-35; their final plans show a supply surplus until 2044-45



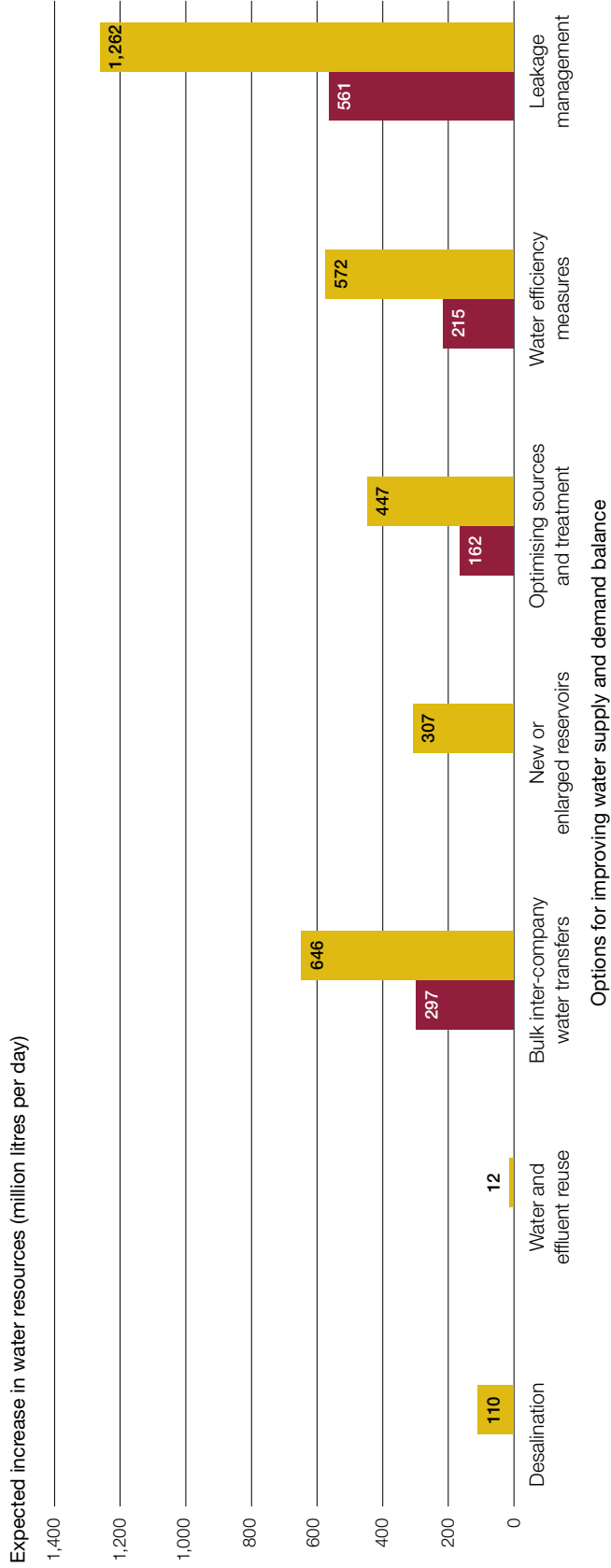
**Notes**

- 1 The baseline scenario represents water company forecasts of supply and demand for water if no measures are taken.
- 2 The final plan scenario represents water company forecasts if all measures in their plans are fulfilled.
- 3 The y-axis has been truncated to offer a clearer view of the future trends.

Source: Environment Agency aggregation of water resource management plan data

**Figure 3**  
Balancing water supply and demand: planned options to increase resources in England

Leakage management is by far the greatest contributor to improving the supply and demand balance



■ 2025  
■ 2045

**Notes**

- 1 Figures show additional water resources planned for each option.
- 2 For example desalination is planned to provide 110 million more litres per day than is currently sourced by 2045.

Source: Environment Agency's analysis of water resource management plans

**1.10** The government's 25-Year Environment Plan sets out a further ambition of reducing the damaging abstraction of water from rivers and groundwater, ensuring that by 2021 the proportion of water bodies with enough water to support environmental standards increases from 82% to 90% for surface water bodies and from 72% to 77% for groundwater bodies.

**1.11** To deliver this, Defra oversees a complex delivery landscape of multiple regulators and privately owned water companies (**Figure 4** overleaf). It expects water companies, which are independently run and managed businesses directly accountable to their customers and shareholders, to provide "resilient water resources supported by robust water industry resource management plans". It determines priorities and objectives for Ofwat, the independent economic regulator of the water industry, to reflect in the way it regulates water services in England. The Secretary of State for Environment, Food & Rural Affairs may issue guidance, in accordance with which Ofwat must act, setting out the government's priorities for regulation of the water sector in England. The most recent statement, issued in September 2017, sets two government priorities: securing long-term resilience in the water supply and protecting customers.

**1.12** These government priorities are reflected in Ofwat's strategic goals:

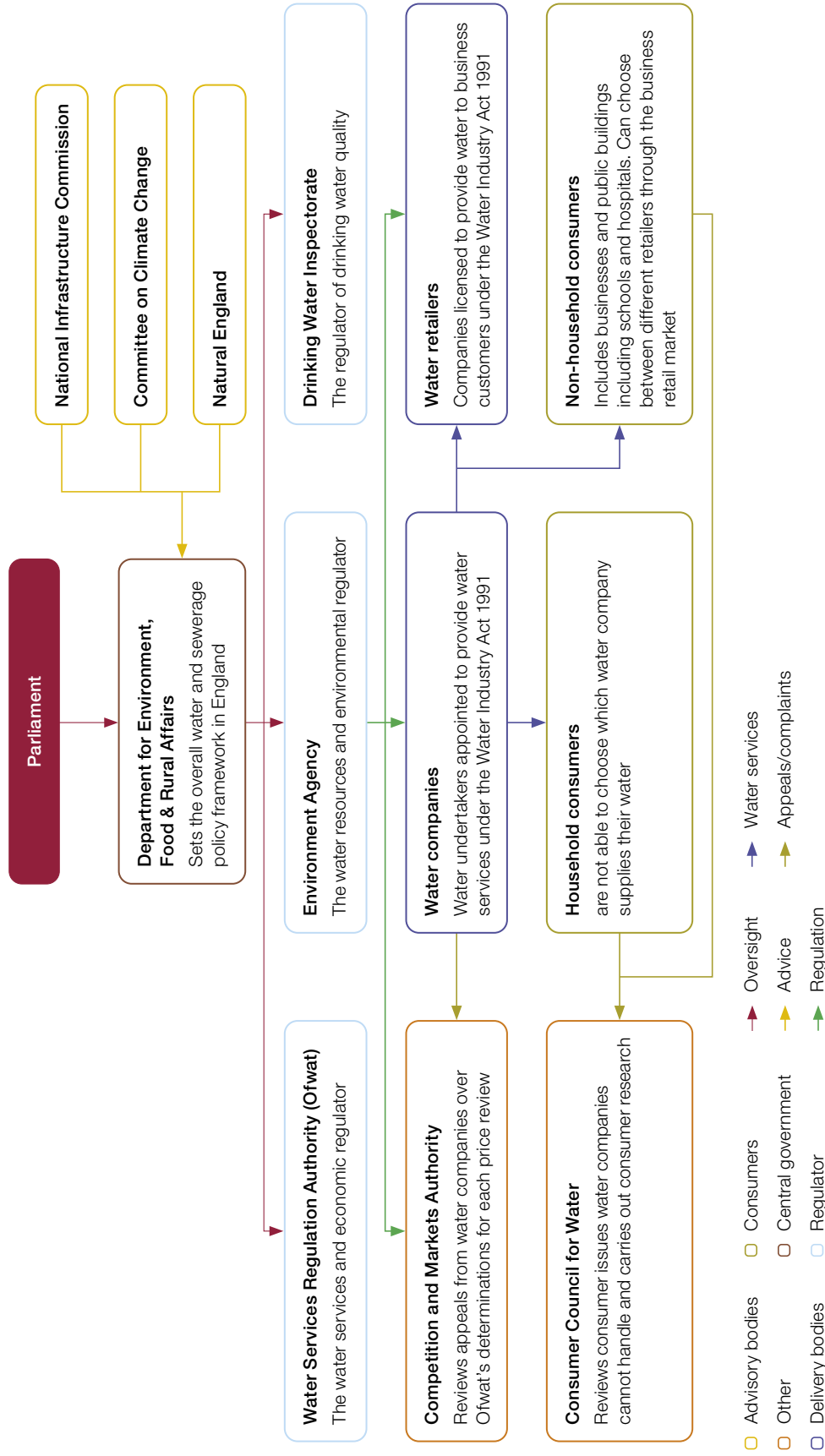
- to transform water companies' performance for customers;
- to drive water companies to meet long-term challenges through increased collaboration and partnerships; and
- for water companies to serve a wider public purpose, delivering more for customers, society and the environment.

**1.13** In addition to its strategic policy statement, Defra sets guiding principles for water companies on water resource management planning. Every five years, water companies are required to produce water resource management plans. The Environment Agency (EA), a non-departmental public body responsible for protecting the environment and for managing water resources in England and Wales, reviews these plans. The EA regulates abstraction licences to ensure that abstractors do not impinge on other abstractors' rights and leave enough water for environmental needs.

**1.14** In order to make the system operate effectively, Defra must provide strategic leadership to the industry. In October 2019, the National Infrastructure Commission published a review of the regulation of the UK's energy, telecommunications and water industries. It concluded that strategic policy statements alone are not enough to provide the regulators with all the guidance they may need from the government, and that the government must provide strategic leadership to "set out a clear, coherent strategy, and empower the regulators to support these strategic investments".

**Figure 4**  
Water resource management delivery landscape in 2020

The Department for Environment Food & Rural Affairs (Defra) has the policy lead over water management and oversees three regulators in the sector



Source: National Audit Office analysis

**1.15** Defra's role in the water resource management process is to provide strategic direction. Under the current system, it expects water companies to consider all the options available to them and justify which options offer best overall value in the long term. Defra does not offer any advice or guidance on different types of intervention. It does not consider this to be part of its remit, although it recognises the value of a central government role in other areas of its policy. For example, it has a policy objective to gather evidence and develop options to inform its future flood and coastal risk management investment programme. Defra believes this is appropriate as the floods programme is largely publicly funded, whereas it is for water companies, as private entities, to make their own investment decisions, considering all the options available to them. However, this does not need to preclude Defra from providing useful guidance and, in 2015, the EA advised Defra that work needed to be undertaken to provide a clear evidence base to support water companies' planning processes and that a lack of knowledge about the costs and benefits of mitigation actions was a barrier to progress on resilience and strategic infrastructure.

### **A new national framework for water resources**

**1.16** There is currently limited collaboration between the water companies. Companies primarily consider solutions that can be implemented within their geographical area and, until recently, there have been limited incentives for companies to develop joint initiatives or cross-boundary solutions to improve supply resilience. Defra acknowledges that this lack of collaboration is hampering the development of more strategic solutions to resilience and expects regional and national planning to play a bigger part in future planning cycles. In March 2020, the EA published a national framework for water resources which will encourage water companies to work more collaboratively and to plan on a regional basis to identify the best solutions for a region and the nation as a whole. It will also expect water companies to work with sectors such as agriculture and the power industry that get much of their water from outside the public water supply by abstracting it directly from surface or groundwater sources. Water companies have limited experience of working with these other sectors. Although some regional groups have played a part in the water resource management process previously, the national framework will establish groups in all regions, with draft regional plans required by the end of 2021.

**1.17** A joint regulatory taskforce has been set up to try to mitigate some of the barriers to investment in infrastructure. Ofwat, the EA and the Drinking Water Inspectorate jointly launched the Regulators' Alliance for Progressing Infrastructure Development (RAPID) in 2019. RAPID aims to accelerate the development of new strategic infrastructure, such as transfers between regions or reservoirs shared between companies, to enable the most promising projects to be ready to begin construction during the period 2025 to 2030, and to develop regulatory frameworks that enable the development of infrastructure that is in the best interests of water users and the environment. Ofwat has set aside £469 million, to be raised through water bills, to allow companies to work together to investigate and develop strategic water resource solutions.

## **Business planning**

**1.18** Every five years, water companies submit business plans to Ofwat setting out their investment strategies for the next five years and for the longer term. In their business plans, water companies seek agreement to the level of funding needed to implement their water resource management plans. Ofwat carries out a review of these plans and determines the price and service package water companies must deliver. In doing so, Ofwat must balance consumers' interests with the need to ensure companies can finance the delivery of water services and to meet other legal obligations, including their environmental and social responsibilities. In December 2019, it published the outcome of its price review, for setting price controls for water companies for the period 2020 to 2025. It announced an expectation that household bills would fall by 12% in the five years to 2025 alongside increased investment by water companies, to be achieved through reducing the return on capital allowed and challenging companies to increase their efficiency.

**1.19** Water companies struggled to meet Ofwat's ambition for them to produce high-quality, ambitious and innovative business plans that are well-evidenced, grounded in excellent customer engagement, and are right first time. Water companies submitted their initial plans for 2020–2025 in September 2018 and Ofwat assessed these on nine criteria. Three-quarters of companies' initial plans fell short in five or more of the nine categories. Their proposals for long-term resilience were the weakest overall, with only two companies meeting expectations. These scores are for the initial plans and do not necessarily reflect the quality of water companies' final business plans, which are subject to several rounds of review, revision and challenge (**Figure 5**).

**1.20** Three draft water plans were given 'fast track' status from Ofwat, meaning they were of sufficient quality to receive financial and reputational benefits. Four draft plans were given 'significant scrutiny' status, meaning their quality, ambition and innovation had fallen well short of requirements.

## **The five-year planning cycle**

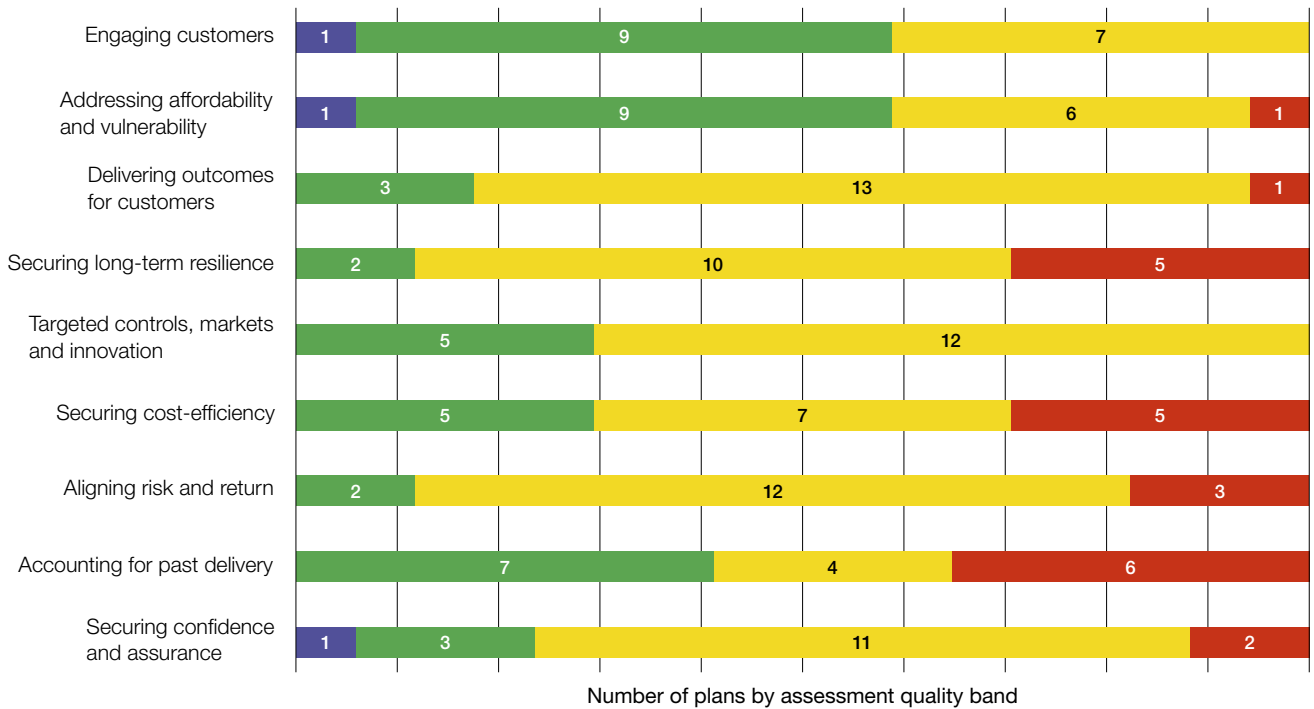
**1.21** Water companies produce their water resource management plans and business plans on a five-year cycle based on guidance from Defra, the EA and Ofwat. The current regulatory framework was designed to provide long-term certainty for investors, companies and their customers. However, more urgent action may sometimes be needed to address climate change and system resilience in the face of increasing risk of drought and floods, raising questions about how well the system can respond when urgent action is needed.



**Figure 5**

Ofwat’s January 2019 assessment of water companies’ initial draft business plans

**Securing long-term resilience was the category that received the lowest overall rating across all companies with only two meeting expectations**



- A: company shows high-quality, ambition and innovation across the test area
- B: company provides an overall high-quality plan and meets stretching expectations
- C: plan falls short
- D: plan falls significantly short

Source: Ofwat, *PR19 initial assessment of plans: Summary of test area assessment*, January 2019

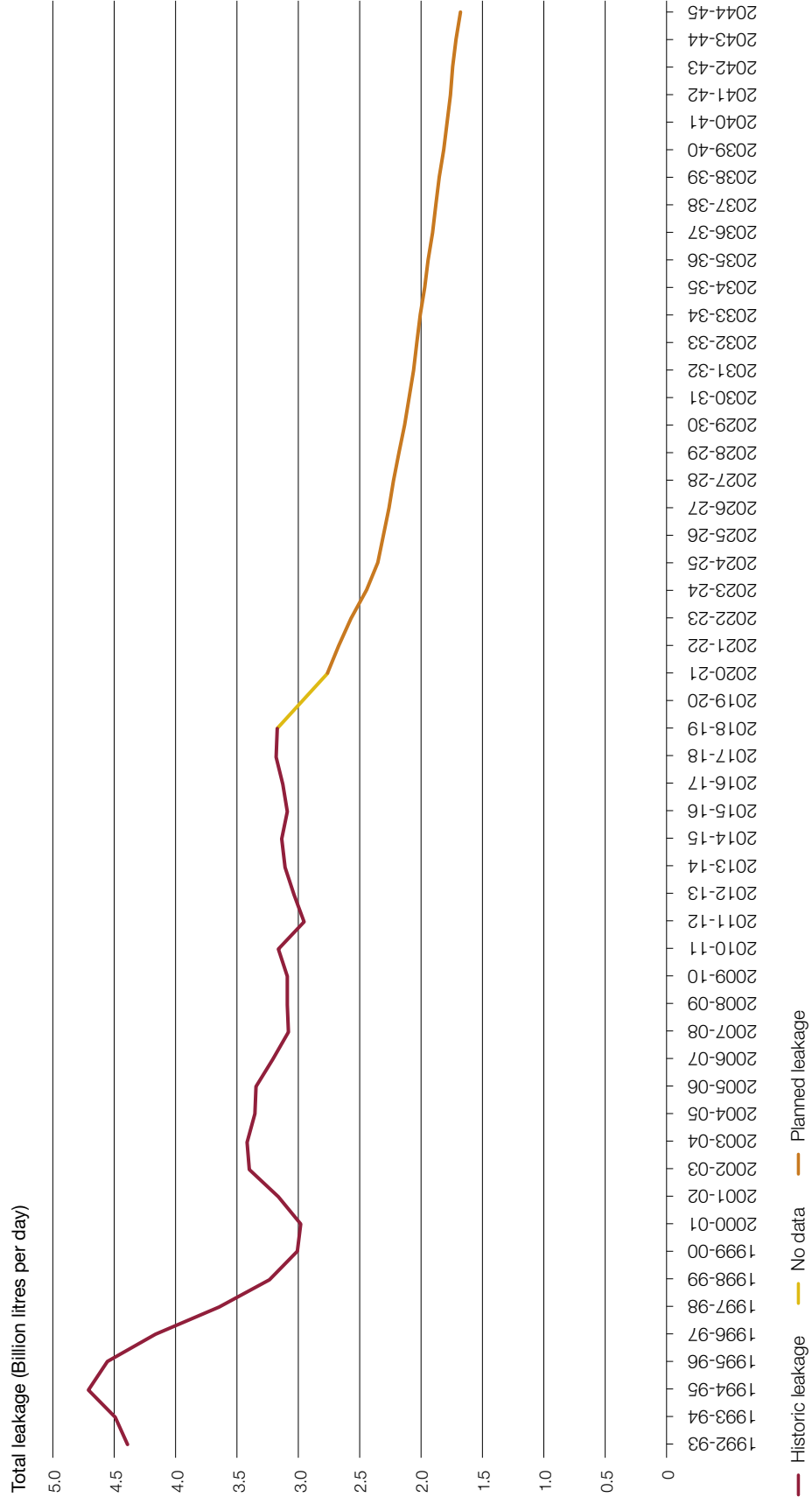
**1.22** Defra asked Ofwat to promote ambitious action by water companies to reduce leakage in its 2017 strategic policy statement, a significant change from its more modest 2013 position, which was to balance leakage reduction against the impact on customer bills. Leakage has increased slightly over the past two planning cycles to 2019 (**Figure 6**). The incentives to reduce leakage were based on what Ofwat calls the “sustainable economic level of leakage”. This required companies to fix leaks only when the cost of doing so is less than the cost of not doing so, including environmental damage and the cost of developing new water resources to compensate for the water lost through leaks. Despite the change in Defra’s position, there were only limited incentives for water companies to improve their performance on leakage before the end of the planning cycle.

**1.23** Ofwat is concerned that imposing revised performance commitments in the middle of a planning cycle would not have resulted in gains that are sufficient to outweigh the potential destabilising impact of doing so. However, it is considering whether to take some performance issues out of the price review cycle, either to develop longer-term processes where appropriate, or to facilitate more rapid action where there are acute performance issues or more urgent policy imperatives. For example, a Defra consultation launched in July 2019 sought views and evidence on measures that could be taken to reduce personal water consumption. The results of this are expected to emerge after companies’ business and water resource management plans are in place. Defra will need to ensure there is sufficient flexibility within the planning cycle to accommodate any resulting changes to the government’s priorities or to what is required from water companies during the five-year period, for example more stretching performance commitments on personal consumption.

**1.24** The Office of Gas and Electricity Markets (Ofgem), the regulator for gas and electricity markets, has a similar approach to planning, although it runs on an eight-year rather than a five-year cycle. It is proposing to return to a five-year cycle with a framework that allows greater use of ‘dynamic’ targets, which are updated during the price control period rather than being determined several years in advance. Our recent report on electricity networks concluded that, to maximise value for money in future, Ofgem must ensure it sets stretching targets for network companies in the next regulatory period, while building enough flexibility into the price controls to respond to unexpected developments.

**Figure 6**  
Leakage in England from 1992-93 to 2018-19 with planned leakage from 2020-21 to 2044-45

Leakage fell significantly between 1994-95 to 2000-01 but since then progress has stalled



**Note**

1 Data for 2019-20 were unavailable at the time of publication.

Source: National Audit Office analysis of EA and Ofwat data

## Price-setting

**1.25** Water companies' investment in increased resilience is paid for through customer bills. Ofwat scrutinises water companies' proposals on the basis of the evidence of need and the efficiency of their proposed costs. Since privatisation in 1989, water bills have increased by about 48% in real terms to fund substantial investment in infrastructure and environmental outcomes. The cost of household water bills is on average around one-third of the cost of energy bills and neither Defra nor Ofwat has an explicit priority to reduce customer bills further. However, reflecting government guidance and its statutory duties, Ofwat has a clear interest in ensuring that bills for all customers are fair and affordable alongside ensuring that companies are able to finance and properly carry out their regulated activities. Water companies present evidence on their customers' willingness to pay for long-term resilience in their business plans but the research underpinning this is carried out independently by each water company and there is no standardised method for collecting the data.

**1.26** Ofwat may reject water companies' proposals to increase investment following a review of a company's evidence to support the need for the investment or its efficiency. Water companies told us they considered the balance between price and investment to be unclear and that the government had not provided a strong enough steer on the pace at which investments should be made, particularly where they consider they have strong evidence that their customers are prepared to pay more to finance infrastructure investment. In the 2019 price review, Ofwat intervened in company business plans to increase proposed investment for drought and operational resilience.

## Social tariffs

**1.27** Both Ofwat and Defra have a commitment to increase support for customers who struggle to afford their bills. They do this through WaterSure, a government-mandated support scheme which caps bills for eligible customers, and through water companies' own voluntary schemes offering reduced 'social' tariffs normally funded through a cross-subsidy by customers that pay the full price. The government has responsibility for setting the policy and legislative framework for addressing social issues, including water affordability. Eligibility criteria for and levels of social tariffs vary significantly between companies according to local needs and customer views. Ofwat estimates that around two-thirds of people that need support are not receiving it. Defra issued guidance to water companies on social tariffs in 2012 but has not taken any further action to improve their use and has not updated its guidance despite saying it would keep it under review.

**1.28** Affordability was a core theme of Ofwat's 2019 price review, and in addition to average bills being expected to fall by 12% before inflation over the period 2020–2025, water companies have committed to an increase in the number of customers on social tariffs from less than one million to more than 1.4 million by 2025, and to providing hardship funds to around 20,000 customers.

# Part Two

## Increasing the supply of water

**2.1** Securing long-term resilience of the water supply is one of the government's key priorities for the water sector. The government expects water companies to adopt a 'twin-track' approach to achieve this, one arm of which is to counter the decline in supply due to expected reductions from climate change and the need to restore sustainability of ground and surface water sources. There are limited options for water companies to increase the amount of water they supply, and high costs are associated with the necessary infrastructure investment.

**2.2** This part of our report describes the main options water companies are considering to bolster the amount of water they supply.

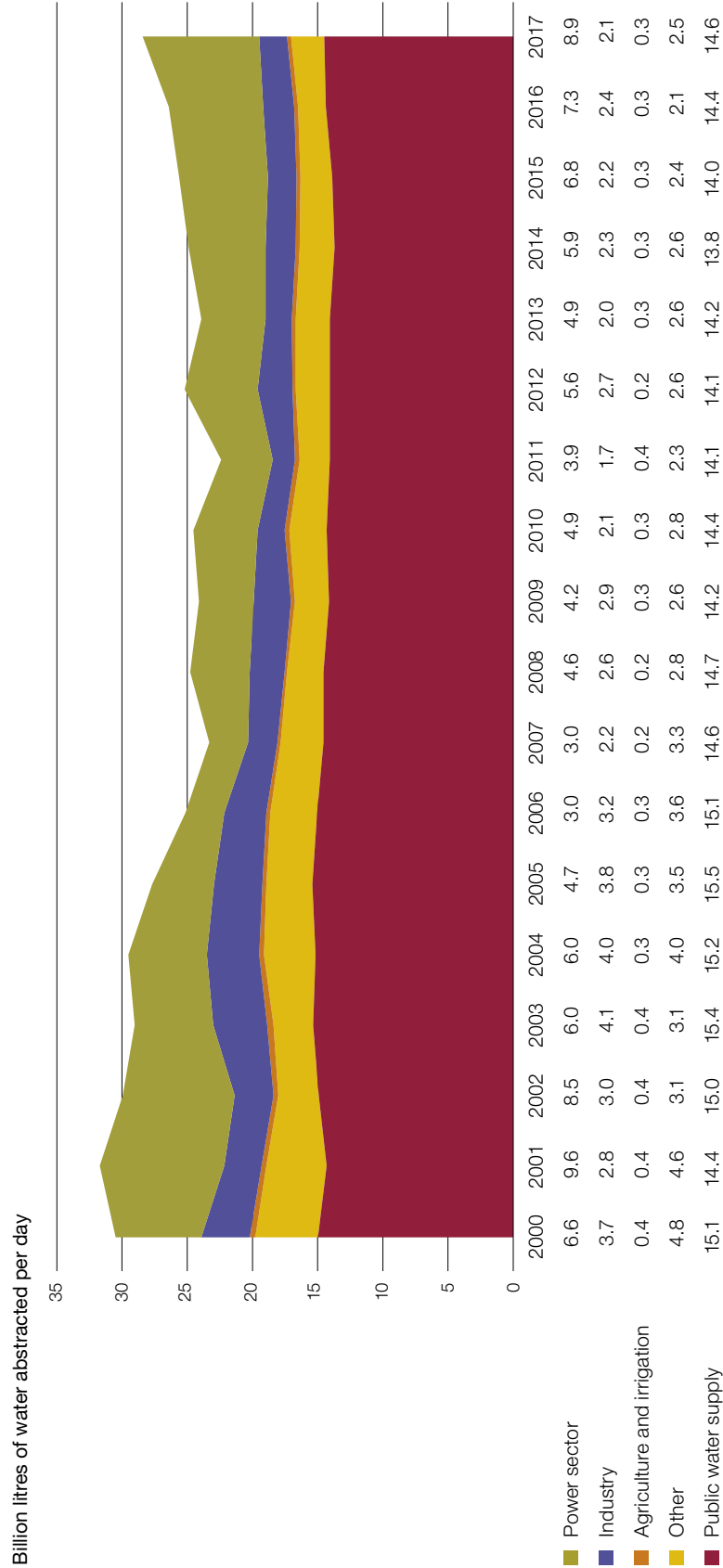
### **Abstraction**

**2.3** Abstraction is the process of taking water out of the ground or from surface water bodies, such as rivers or lakes, and is how most water sourced by water companies is obtained. The Environment Agency (EA) manages abstraction in England by granting licences to abstractors. Water companies are licensed to take close to 15 billion litres of water per day from non-tidal water bodies, 51% of the total licensed abstraction in 2017, with the remainder mostly used by the power sector and industry (**Figure 7** overleaf). This water is then treated and distributed through pipes to homes and businesses.

**2.4** For significant users of water, such as paper mills and farmers, it can be more cost-effective to source their own water. Non-water company users account for 49% of the total water abstracted. Although they are covered by abstraction licensing, they are not included in water companies' water resource management plans, which therefore only provide a partial picture of future water resources as a whole. No robust method for forecasting the total demand in an area has yet been developed.

**Figure 7**  
Licensed freshwater abstractions in England by sector between 2000 and 2017

The public water supply accounts for around 15 billion litres of water each day, around half of the total water abstracted.  
The power sector is the second biggest abstractor.



**Note**

1 The power sector is a non-consumptive user of water, which means water is used and then returned further down the water course without needing to be treated.

Source: The Environment Agency's abstraction data

**2.5** Abstraction licences are only offered where there are sufficient water resources to support environmental standards, and where other abstractors in the catchment area will not be adversely affected. In parts of the country, especially the south-east, the scope for new abstraction is very limited (Figure 1). New licences are issued on a time-limited basis and can be reviewed periodically. If water resources become limited in a catchment area, due to climate change for example, then the licences in that area can be altered to relieve pressure. Historically, licences were issued on a permanent basis. If a licence needed to be altered, the EA would need to pay the licence owner compensation. The Water Act 2003 required all new licences to have an end date but by 2018 permanent licences still represented 70% of the total, accounting for half of all water abstracted.

**2.6** Abstracting too much water from a source can lead to physical changes that damage the environment, for example by reducing biodiversity. One in five surface water bodies faced over-abstraction in 2018. A key objective of the government's 25-Year Environment Plan is to address unsustainable abstraction so that water is not taken at a rate that leaves bodies without enough water to maintain environmental standards and biodiversity. A mechanism for delivering this objective is the Water Industry National Environment Programme. Through this, the EA and Natural England set out actions that water companies must deliver in their business plans, such as protecting certain water bodies or putting in place measures to prevent the spread of invasive species. The actions in the programme represent the environmental obligations the EA requires the water companies to meet. In total, the actions are expected to cost water companies approximately £4.9 billion over five years. Other water users such as industry and agriculture are not covered by the scheme.

**2.7** The amount of water provided directly by abstraction to the public water supply is set to decline over the next 25 years. New abstraction makes up only a very small part of water company plans to source additional water, contributing only a further 48 million litres per day by 2045. Water companies plan to reduce existing abstraction levels by 480 million litres per day by 2045 to restore them to sustainable levels. On top of this, water companies are required to account for climate change when forecasting future supplies and, across England, climate change is predicted to reduce supplies by 600 million litres of water per day by 2045. This means that, nationally, water companies face a net loss in the total supply each day from abstraction of 1.08 billion litres by 2045, equivalent to around 7% of current supply, that will have to be met through additional alternative supply measures or by reduced demand.

## **Infrastructure investment**

**2.8** Although the scope for sourcing additional water through abstraction is limited, there are other options available that can help bolster supplies. However, these all come at a higher cost than abstraction, requiring significant infrastructure investment.

### **Desalination**

**2.9** One way to increase total supply without abstracting more fresh water is through desalination. This process strips salt from seawater or 'brackish' water (water that has more salinity than freshwater, but not as much as seawater) to produce fresh drinking water. This is commonly used in countries with limited water resources, such as in the Middle East.

**2.10** Desalination is unaffected by droughts as it draws water from the sea, offering a backup source of water, but there are several drawbacks to its operation in England. The process is energy-intensive, the waste produced is damaging to the environment and the treated water requires blending for taste. Plants are expensive to build and run. Thames Water currently owns the only desalination plant in England, capable of supplying 150 million litres of water per day to London during drier periods. Recently, the plant has been beset by long-term operational issues. Desalination could make significant contributions for some local areas with three more plants receiving funding in the 2020–2025 price control period. Currently, water companies in England plan to source an additional 110 million litres per day through desalination by 2045.

### **Reservoirs**

**2.11** Building or enlarging reservoirs can help strengthen resilience in water supplies by storing water that can be used when other sources become restricted. Water companies can fill reservoirs using an abstraction licence when supplies are plentiful and then draw water from them without restriction during drier periods. At the end of 2019, the Water Services Regulation Authority (known as Ofwat) agreed to a proposal from Portsmouth Water to construct a reservoir to serve customers of Southern Water, the first reservoir to be built in the south east since the 1970s, one of six reservoir projects accepted in the 2019 price review.

**2.12** Water companies currently expect no increase to supply from new or enlarged reservoirs before 2025 but plan for an additional 472 million litres per day by 2045. Reservoirs need to be planned well before they are needed, as the National Infrastructure Commission reports it takes around 10 years from the decision to build to being able to use the water supplied. Several reservoir projects are planned to start in 2020–2025 and have been partially funded in the 2019 price review (including three identified as part of the additional strategic regional water resource solution funding). Delivery of many of these will span at least two price review periods.



## Bulk water transfers

**2.13** While some parts of the country face deficits in water supply, others are expected to have a surplus for the foreseeable future. Transferring water between these areas is another option to increase the resilience of supply without relying on unsustainable abstraction. To facilitate these transfers, water companies need to use existing canals or pipe networks connecting these regions or construct new ones. Most water companies will look to do this within their own supply area. For example, Yorkshire Water has connected 99% of its customers to a single grid network.

**2.14** Water companies can also enter into an agreement with another company to transfer water between them. The government has been encouraging water companies to consider inter-company transfers for more than a decade. In its 2008 water strategy for England, the government urged water companies to consider the full range of options to share water including, for example, “further bulk transfers of untreated water and potentially ... the development of ‘regional water grids’ to move water around”. Despite this, by 2018, transfers of water between companies made up only an estimated 4% of total water company supplies (**Figure 8** overleaf). As transporting water over large distances can be costly, requiring pumping and storage infrastructure, they will play a greater role during times of drought when a receiving company cannot source enough water from other means.

**2.15** According to water companies’ plans, transfers are expected to contribute an additional 237 million litres per day by 2025 and 646 million by 2045 (Figure 3). Several barriers to transfers exist. There are regulatory issues, in that the EA and Ofwat have a different focus: the EA is predominantly concerned with protecting and enhancing the local water environment while Ofwat seeks to ensure that environmental outcomes are achieved in a way that delivers best value overall. There are also technical challenges, as transfer schemes are complex, expensive, involve a large range of stakeholders and often require water companies to collaborate to develop viable schemes. The Regulators’ Alliance for Progressing Infrastructure Development (RAPID) joint unit, created in 2019, aims to resolve some of these challenges.

**2.16** Ofwat introduced financial incentives for transfers in 2014 but in 2018 told the Environment, Food & Rural Affairs Select Committee, in a response to its recommendations, that it was disappointed with water companies’ progress in this area and believed there were economic, environmental and resilience benefits to be achieved from planning more effectively across company borders. In its response to the Committee’s report, Ofwat said it decided not to increase incentives for transfers for the next price period, believing the other barriers are more significant than the level of direct financial incentives available. As part of the national framework, an EA-led workstream is looking to identify and remove or reduce these barriers.

**Figure 8**

Forecast water transfer agreements between companies for 2018-19

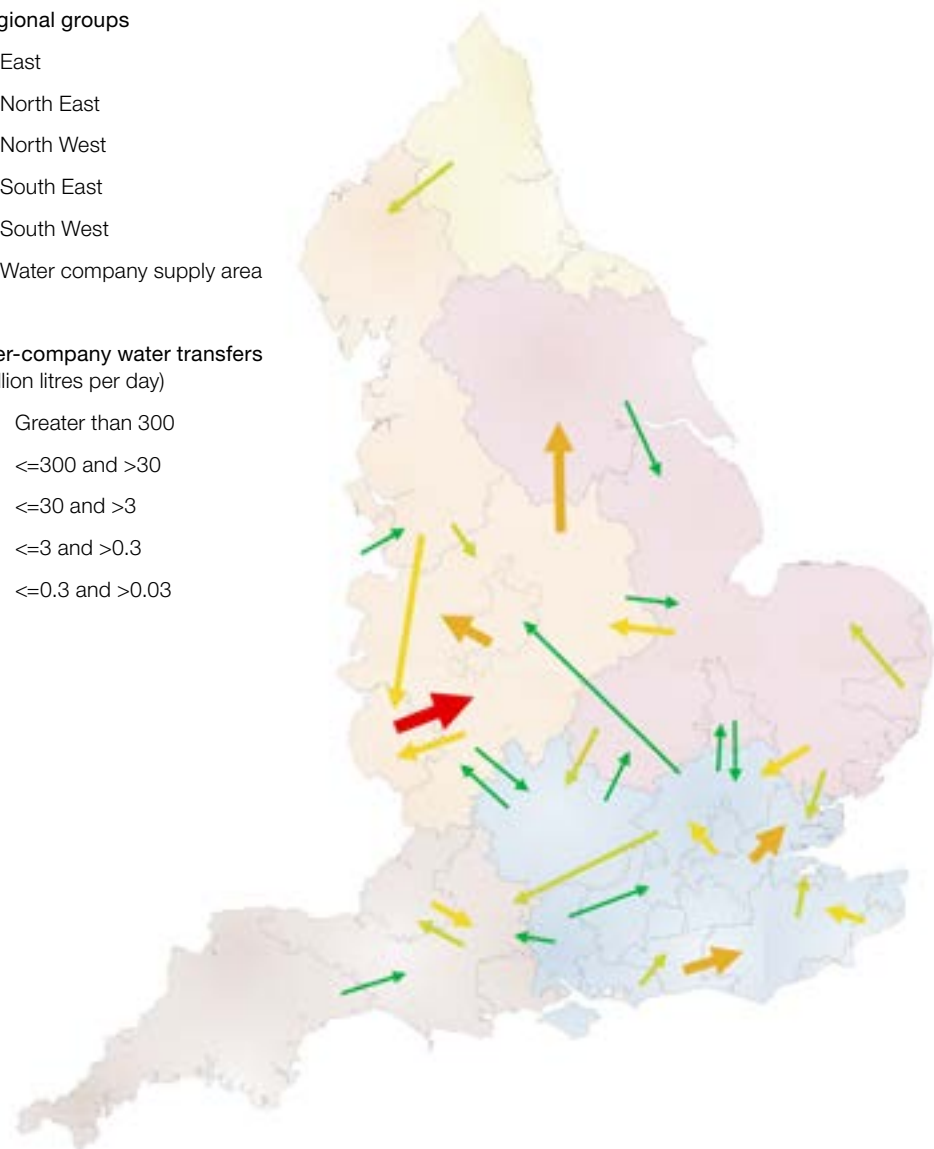
**By far the largest transfer agreement is between Welsh Water and Severn Trent Water**

Regional groups

- East
- North East
- North West
- South East
- South West
- Water company supply area

Inter-company water transfers  
(Million litres per day)

- ➔ Greater than 300
- ➔ ≤300 and >30
- ➔ ≤30 and >3
- ➔ ≤3 and >0.3
- ➔ ≤0.3 and >0.03



**Notes**

- 1 Arrows illustrate transfer agreements between companies and do not represent the exact physical location of infrastructure.
- 2 Figures are forecast transfer agreements and may not represent actual volumes transferred.
- 3 Transfers of under 3,000 litres per day are not shown.
- 4 Forecasts were published in 2018-19.

Source: National Audit Office analysis of returns submitted to Ofwat by water companies

**2.17** A 2018 report by the National Infrastructure Commission found the scale of the infrastructure required to boost transfers to the level needed goes well beyond that seen in the plans currently proposed by water companies. It reported there was a positive cost–benefit case for more transfers and a network of strategic transfers could potentially provide additional capacity of about 700 million litres per day at costs comparable with other options.

### Effluent reuse

**2.18** Waste water from homes and businesses is sent to treatment plants via the sewer network. The water is treated to a level where it can be reintroduced to the environment without causing significant pollution, generally being discharged into rivers or the sea. It is generally not treated to a standard that would allow it to re-enter the public water supply. However, it can be reused for activities that do not require this standard, such as industrial cooling or golf course irrigation. If water is reused for these activities it frees up more raw water to be abstracted for other uses, including the public water supply. In 2012, around 0.2% of treated water was reused for industrial applications, equivalent to 1.5 million litres of water per day. Alternatively, waste water that would be discharged into the sea can be diverted upstream to boost river levels and support further abstraction. Water companies plan for an additional 12 million litres of waste water a day to be reused in this way by 2045 (Figure 3). Although water companies are not considering direct effluent reuse in the public water supply over the next price control period this could become an option as technology develops.

## Part Three

### Reducing the demand for water

**3.1** The second arm of government's 'twin-track' approach to securing resilience in the water supply is to reduce demand for water. Water companies predict a 4% increase in demand over the next 25 years if measures are not implemented to reduce it. Increasing population is the main driver behind this. The available options for increasing supply are limited and take considerable time to produce results, so effective demand-side measures will be vitally important in the coming decades. Despite this, public awareness of the need to reduce water consumption is low and the government has done little to supplement water companies' efforts to promote the need to improve water efficiency.

**3.2** Reducing leakage is also important because every litre of water lost through leakage needs to be replaced by other means, for example additional abstraction from ground or surface water sources. Water companies estimate that replacing water lost through leakage will account for more than 20% of total demand by 2020-21.

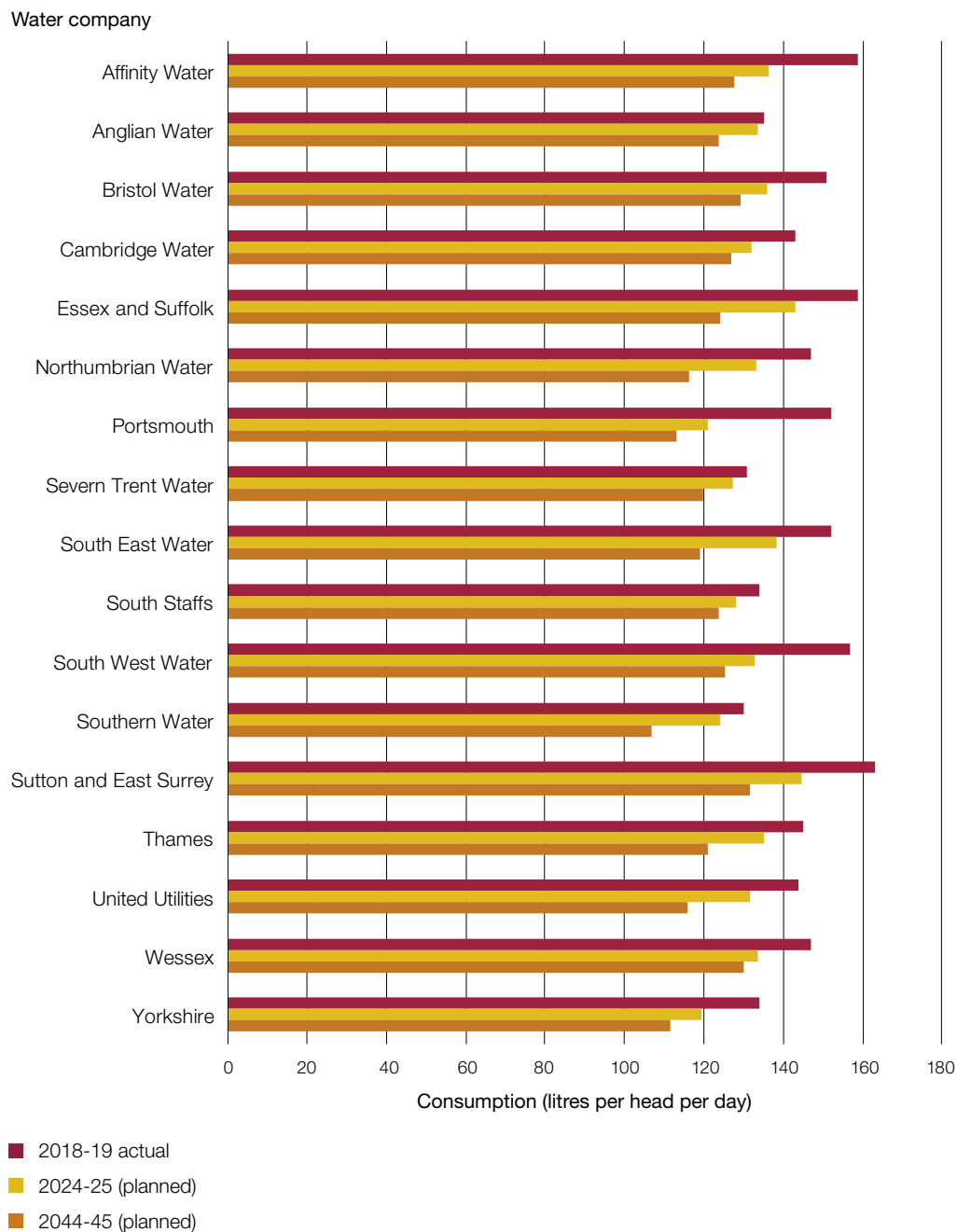
**3.3** This part of our report examines the government's approach to reducing demand and how it plans to reverse the increase in demand that we have seen in recent years.

#### **Household water consumption**

**3.4** Household water consumption has been going up in each of the four years to 2019. It now stands at 143 litres per person per day, an increase of 3% since 2014-15. This is significantly higher than Germany at 121 litres (2016-17) and the average of 128 litres for EU member countries (2017). In June 2018, the Water Services Regulation Authority (known as Ofwat) reported that some water companies' short-term reduction targets are very low and longer-term ambition is "modest", particularly for companies with high existing consumption rates and large resource challenges (**Figure 9**). According to water companies' current plans, water efficiency measures will contribute 215 million litres per day to balancing water demand and supply by 2025, and 572 million litres by 2045 (see Figure 3).

**Figure 9**  
Planned per capita water consumption in England by water company

Planned percentage reduction to per capita consumption varies significantly between companies



Source: Environment Agency analysis of water resource management plans

**3.5** In its 25-Year Environment Plan, published in January 2018, the Department for Environment, Food & Rural Affairs (Defra) committed to incentivising water efficiency, reducing personal use and to working with the industry to set an ambitious personal consumption target and agree cost-effective measures to meet it. The target is for water companies, not individuals, and would be in the form of an average personal water consumption for their household customers. However, Defra has not yet announced a target despite a commitment to do so by the end of 2018. The consultation it launched in July 2019 on measures to reduce personal consumption urged water companies to be more ambitious and sought views and evidence on measures to reduce water consumption. It did not specifically solicit views on ways to work with industry to set a target, although its launch page said this was a focus of the consultation. The results of the consultation have not yet been published but it is not clear how the responses to the questions posed will help Defra set a meaningful target.

**3.6** Water metering has the potential to reduce consumption and Defra policy has been consistent in encouraging more widespread use. Water companies plan to increase the proportion of households that have meters from 52% in 2018 to 83% by 2045, contributing to the 572 million litres a day expected to be saved by water efficiency measures (Figure 3). A 2015 report by the Environment Agency (EA) found that meter roll-out could reduce consumption by around 10%. Currently, there are restrictions on whether water companies can charge on the basis of the volume of water used. The National Infrastructure Commission, Committee on Climate Change and the Environment, Food & Rural Affairs Select Committee have all recommended that metering should be extended nationwide to increase uptake. Defra included questions on extending compulsory metering in its 2019 consultation on measures to increase water efficiency.

**3.7** 'Smart' water meters, which can provide real-time usage statistics, have the potential to increase savings by a further 2% and can increase accuracy of leak detection. We reported in 2018 that the cost of installing smart energy meters is equivalent to £374 per household, but this is expected to be more than offset by reduced energy consumption and operational cost savings for the industry. The National Infrastructure Commission concluded that smart water meters would at worst be cost-neutral and still lead to increased water efficiency. However, with the average household energy bill being roughly three times the average water bill, it is easier to absorb the cost of installation into an energy bill than it would be into a water bill without a significant percentage increase.

## Tackling leakage

**3.8** Ofwat challenged water companies to reduce leakage by at least 15% by 2025 without passing on extra costs to customers. Half of the initial water resource management plans submitted by water companies failed to meet this challenge. In March 2018, Defra wrote to each of the water companies outlining its response to their initial plans. In these letters, it pushed the seven least ambitious companies to do more to meet Ofwat's challenge. In their final water resource management plans, several companies more than doubled their leakage reduction forecasts (**Figure 10** overleaf). Ofwat now expects leakage to fall by 16% between 2020 and 2025, which would result in 572 million litres of water a day being saved (Figure 3).

**3.9** Leakage was only reduced by 2% between 2012-13 and 2018-19, despite this being a priority for Defra. To reach the starting point set out in the water companies' plans for 2020–2025, a further reduction of 10% would be required over the next year alone (see Figure 6). Ofwat has acknowledged that, for some companies, achieving the levels of reduction envisaged will rely on adopting as yet unknown or untested approaches.

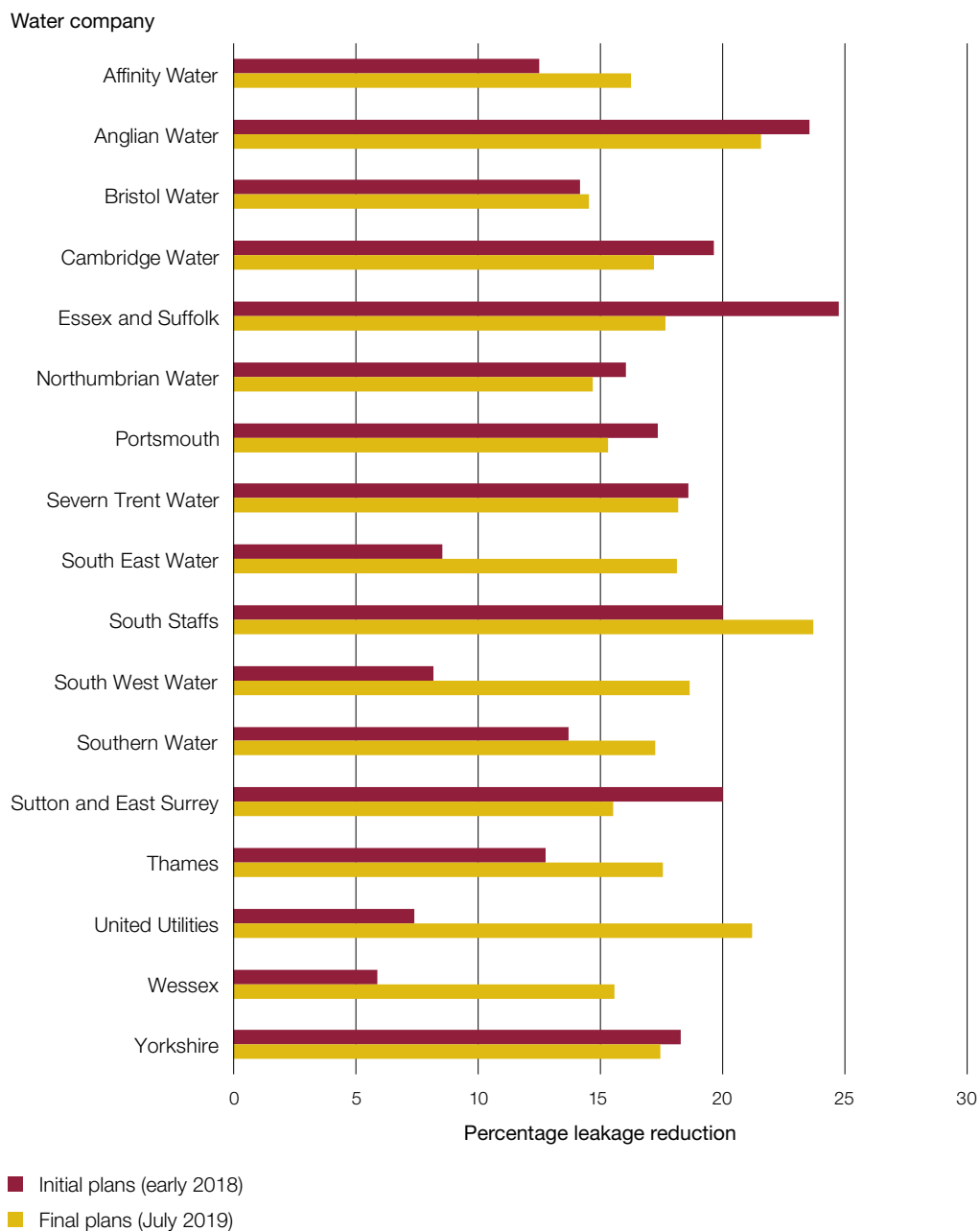
**3.10** The public water supply ends at the access point to a property and leakage occurring within the property is defined as 'customer leakage' or customer supply pipe losses (CSPL). The CSPL is included in water company leakage targets and all companies need to have a policy on tackling it. There are approximately 225,000 kilometres of customer supply pipes in England and Wales, making up almost 40% of the overall water piping network. In a 2018 report commissioned by Ofwat, Artesia Consulting estimated average CSPL at about 30 litres per property per day (about 8% of household consumption). The EA expects that an increase in smart metering usage will improve the understanding of where CSPL occurs, thus making it easier to address.

**3.11** In 2013-14, Defra consulted on whether customer leakage should become the responsibility of water companies rather than property owners but decided that the consultation evidence did not merit such a change. In its 2018 study, Artesia Consulting recommended that water losses from leaking toilets are tackled through product standards for new toilets, along with better monitoring and resolution of plumbing losses.

**Figure 10**

Initial and final water resource management plan projections for leakage reduction between 2020 to 2025 by company

Four water companies more than doubled their proposed leakage reduction between their initial and final water resource management plans



**Note**

1 Leakage reduction is measured from a 2020 baseline on a litres per property per day basis.

Source: Department for Environment, Food & Rural Affairs' analysis of initial and final water resource management plans



## The non-household market

**3.12** In April 2017, the government launched the business retail market for water. This enables non-household consumers to shop around for alternative water suppliers rather than having to buy water and water services from the regional supplier that is a monopoly for household customers. A key rationale for opening up the market was improved water efficiency: Ofwat expected 2% water efficiency savings and financial savings of £84 million for water companies and new business retailers over five years. Ofwat does not know whether these savings, which were expected to come about because retailers would offer customers advice and support on water efficiency, have materialised. Improved water efficiency in this market has the potential to contribute significantly to meeting aspirations for sourcing and delivering water on a long-term, sustainable basis, as Ofwat estimates that business customers eligible to participate in the business retail market account for nearly a third of all water delivered to customers in England. Moreover, both wholesalers and retailers are expected to help deliver improved levels of water efficiency in the non-household sector, particularly given that they have a statutory duty to promote efficient use of water by their customers.

**3.13** Awareness and take-up of the market has been slower than anticipated. In July 2019, the annual Ofwat Business Customer Insight Survey found almost half (47%) of eligible businesses, charities and public sector organisations were unaware of the market. Only around 3% of consumers switched or renegotiated a deal during 2018-19, similar to the previous year's figure, and only 0.3% of switchers and 4% of renegotiators have received water efficiency advice or leakage control services as part of the package of benefits. Defra told us that Ofwat and the EA intended to write a joint letter to retailers in March 2020 to encourage further efforts on this.

**3.14** The business retail market is expected to achieve improved water efficiency across both the private and public sectors. Therefore, water efficiency savings across the NHS, local government, schools, and the overall infrastructure of public services are reliant on a market that is still in the early stages of development and affected by high levels of complaints and comparatively low customer satisfaction. Customers of the business retail market in England are significantly less likely to be satisfied (at 69% in 2018) than business customers in Wales (90% in 2018) where the business retail market is not open. The Consumer Council for Water has received a 382% increase in complaints (based on 2018-19 figures) from business customers since the market opened in April 2017.

**3.15** Ofwat is not planning to implement a retailer service incentive mechanism in the next price review period but wholesalers and retailers have worked together to develop a measure of retailer satisfaction, which is scheduled to come into effect from April 2020. Stakeholders have told us that not enough priority is given to promoting water efficiency measures in the business retail market, and that tight profit margins for retailers are a barrier.

### **Working with other government departments**

**3.16** Water demand can be reduced through measures adopted by government departments and agencies in managing the public sector estate. The Greening Government Commitments set out the actions government departments and their agencies will take to reduce their impacts on the environment, including water efficiency. However, these do not extend to local authorities so there may be untapped opportunities in local authority-owned public buildings. Schools and hospitals consume large quantities of water, although there is a lack of evidence on precisely how much. The Department of Health & Social Care issued guidance to hospitals on water efficiency in 2013 but has not updated this since then to take account of the business retail market or recent water-saving innovations that hospitals could adopt. The Department for Education published *Top tips for sustainability in schools* in 2018, but this focused almost entirely on energy efficiency, with only a couple of bullet points on water efficiency.

**3.17** Other government departments lead on policies where Defra could use its influence to reduce water usage, for example water-efficiency labelling. This formed one of the eight themes in Defra's July 2019 consultation and is defined by Defra as a programme that assesses the amount of water used by fixtures, fittings and appliances, and includes an efficiency rating. The consultation referred to a 2018 study for Defra that recommended a government-led mandatory label for all water-using products which aligns with building regulations and minimum standards. It was further proposed that only products above a certain label rating should be available for sale, either for new builds or retrofitting.

**3.18** The Defra consultation stated these changes could be achieved through amendments to The Water Supply (Water Fittings) Regulations 1999, which are in place to achieve water efficiency through cutting wastage and undue consumption. It was envisaged that a 10-year phase-in would be required for such changes, with the resulting potential to achieve a reduction of 6.3 litres per person per day in 10 years and up to 31.4 litres after 25 years.

**3.19** Building regulations for water consumption is another of the eight themes in Defra's consultation. Noting that the government plans to build 300,000 homes per year by the mid-2020s, consultees were asked whether they think the current arrangements for water efficiency are effective. The current regulations state that all new homes must be built to a standard of water usage of 125 litres per person per day, with the option of 110 litres for water-stressed areas. The 2019 Spring Statement made a commitment for new-build homes to be future-proofed with "low-carbon heating and world-leading levels of energy efficiency", but no pledges were made on water efficiency. However, the Committee on Climate Change recommended that Defra should encourage water companies and local authorities to run retrofit and behaviour change programmes in existing homes, noting that several studies have demonstrated numerous benefits to linking water- and energy-efficiency policy and retrofits.

**3.20** Defra told us it is starting to work with other government departments to explore how water can be given greater prominence within building and planning regulations, product labelling and product standards and is using the responses from its July 2019 consultation to help shape this work.

**3.21** Defra could also work with the Department for Education to raise the profile of water-efficiency teaching in schools. One water company told us that working with primary schoolchildren was very effective at raising awareness at an early age. Until 2014, there were specific units within the national curriculum on 'Investigating rivers' and 'Water'. However, following a review of the national curriculum in 2014, coverage of water-efficiency issues became more fragmented and this water company found it more difficult to gain traction in schools as a result.

## **Behaviour change**

**3.22** Defra recognises the importance of behaviour change in improving water efficiency. In its July 2019 consultation, it stated: "Water efficiency needs to become embedded throughout everybody's lives – wasting water should be seen as going against the norm."

**3.23** In April 2018, Defra published a rapid evidence assessment which identified examples of effective water-saving measures from overseas. The report identified five main ways where behavioural change can reduce household water demand, including information and awareness-raising campaigns. Water companies have a statutory duty to promote the efficient use of water to their customers and the government has relied on them to promote appropriate messages, for example through social media and advice included with customer bills. But there is no evidence to show what impact, if any, this material has on public awareness of the need to reduce personal consumption or how to do so. Despite the pressures on future water resources, the Consumer Council for Water found that nearly three-quarters (73%) of the public are confident when asked about the long-term availability of supply. In July 2019, a group of organisations, including the EA and Water UK, the trade association for water companies, launched the 'Love Water' campaign to raise awareness of the importance of water and the role everyone plays in protecting it, but other than a twitter feed, there has been little further activity since its launch.

**3.24** Defra's July 2019 consultation urged water companies to be more ambitious and sought views and evidence on measures that could be taken forward to reduce personal water use. It also asked for views on which of a range of organisations, including the government, are best placed to communicate about how to reduce personal water use. The results of the consultation have not yet been published.

**3.25** In 2011, a water-efficiency initiative by Waterwise and the Energy Savings Trust, funded by the European Commission, found that a combined strategy of advice about water usage and water-saving devices has the greatest impact on behavioural change. The introduction of smart metering for water is regarded by the Committee for Climate Change as the key tool for measuring future demand and facilitating measures to reduce it. Smart meters are now recognised as a key component of achieving behaviour change in the energy sector, but water companies have made slow progress in installing them.

### **Rainwater harvesting**

**3.26** Not all uses of water require it to be treated and potable. Rainwater can be used for flushing toilets, washing clothes or for external uses such as washing cars or watering plants. Together these make up over one-third of the water used by households, equating to around 2.6 billion litres of water per day (**Figure 11**). Rainwater harvesting has the potential to relieve pressure on the public water supply by providing an alternative source for non-potable uses. A 2018 report commissioned by Ofwat found that community rainwater harvesting could be implemented more widely in the near future without significant innovation. On behalf of the EA and water companies, Waterwise, an independent organisation focused on reducing water consumption in the UK, is initiating work to update understanding on the uses of rainwater.

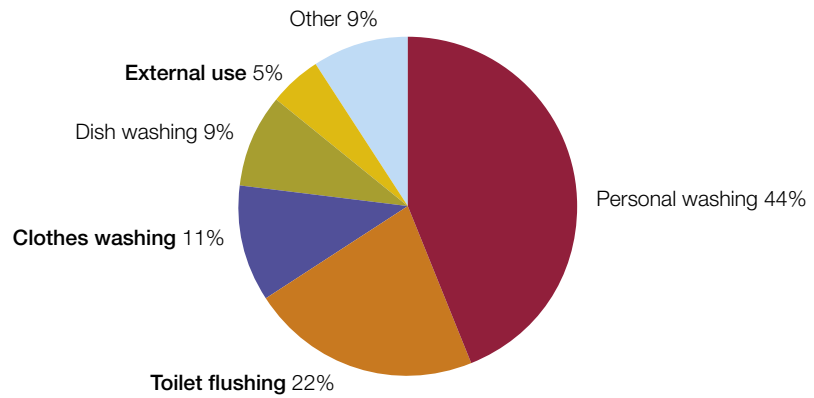
**3.27** Measures for rainwater harvesting fall outside the direct control of water companies because private properties must install systems to capture and recycle rainwater themselves. Farmers can apply for grants under the Countryside Stewardship Scheme to help fund such systems, but no grants are currently available for domestic properties. In 2012, the Environment, Food & Rural Affairs Select Committee recommended that Defra should take more active steps to promote rainwater harvesting and seek to incorporate incentives or requirements for their inclusion in the design of new developments.

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**Figure 11**

Estimated household water use in England 2020-21

Around a third of household water use does not require water of drinking water standard

**Note**

1 Bold categories do not require water meeting the drinking water standard.

Source: Water companies' water resource management plans

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# Appendix One

## Our audit approach

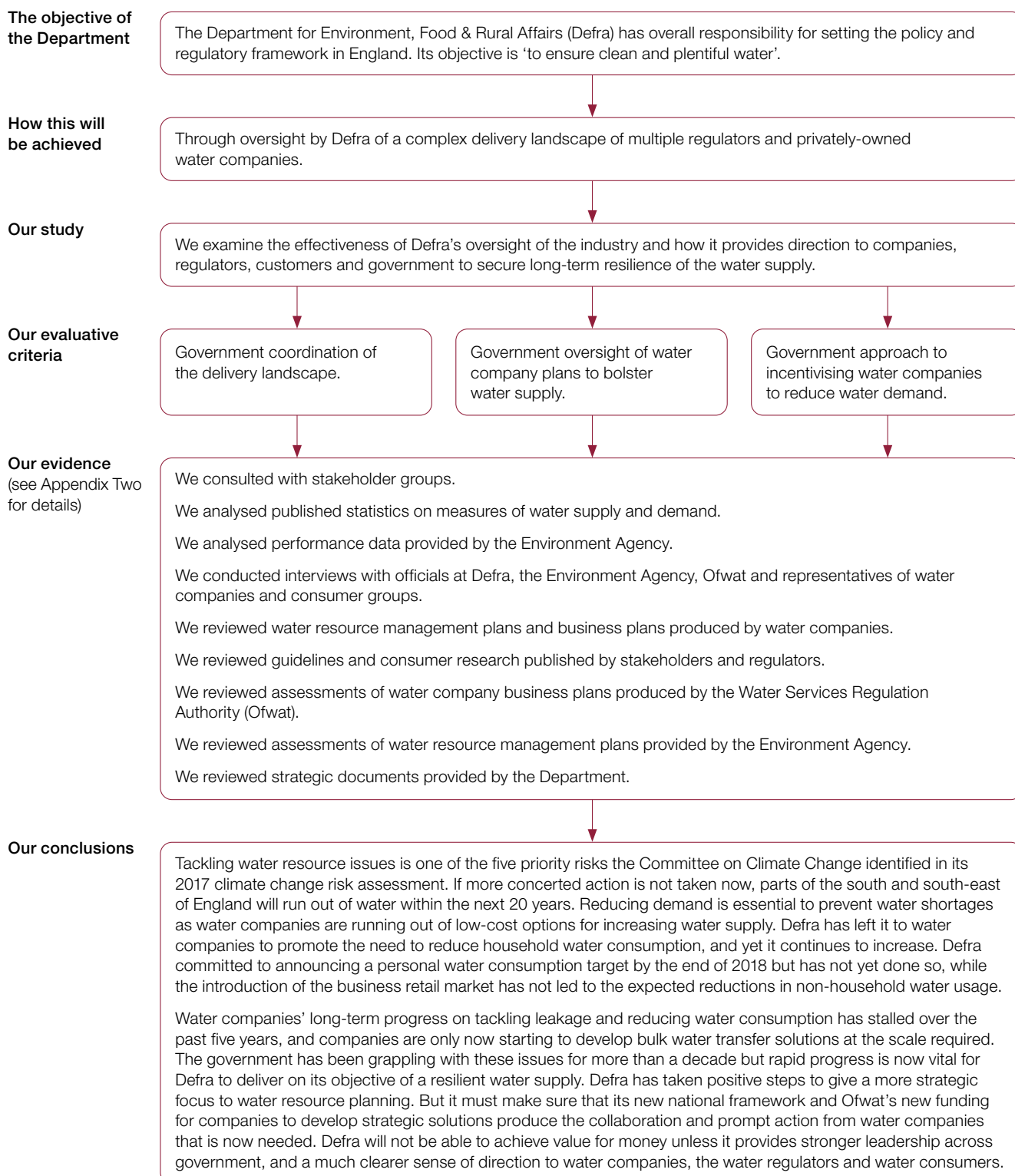
**1** This report examines how effectively the Department for Environment, Food & Rural Affairs (Defra) oversees supply and demand management in the water industry and is structured as follows:

- Part One sets out the policy and delivery landscape that governs how water is delivered in England and assesses the effectiveness of the government's oversight in ensuring the industry delivers its strategic policy objectives.
- Part Two discusses how to increase water supply.
- Part Three reviews how to reduce the demand for water.

See **Figure 12**.

**Figure 12**

## Our audit approach



# Appendix Two

## Our evidence base

- 1 We conducted our examination of water supply and demand management between July and December 2019. Our audit approach is outlined in Appendix One.
- 2 We reviewed the water resource management plans produced by water companies for the Environment Agency.
- 3 We reviewed business plans submitted by water companies to Ofwat, and the draft and final determinations produced by Ofwat for the Price Review 2019.
- 4 We reviewed publications on reducing water consumption and securing long-term resilience of supply produced by Defra, Ofwat, the Consumer Council for Water (CC Water), the Committee for Climate Change and other stakeholders.
- 5 We interviewed a range of organisations and individuals with a role in water supply and demand management:
  - Defra;
  - the Water Services Regulation Authority (Ofwat);
  - the Environment Agency;
  - CC Water;
  - private-sector water companies;
  - Natural England;
  - Committee on Climate Change;
  - water resources regional groups;
  - academic experts.
- 6 We reviewed a range of documents related to the oversight of water supply and demand management by Defra.



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