



Futureproofing our water supplies

A CONSULTATION ON OUR EMERGING REGIONAL PLAN FOR SOUTH EAST ENGLAND

JANUARY 2022



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The Challenge



SECTION 2
The Proposed Solution



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What is this emerging plan?

Water Resources South East (WRSE) is an alliance of the six water companies that supply drinking water across South East England. We are working collaboratively with Government, regulators and stakeholders to develop a regional plan that addresses the climate and environmental emergency facing our water environment and secures the region's future water supplies.

This is a consultation on our emerging regional plan. It sets out how this precious and essential resource could be used in the most sustainable way in the years to come. Its aim is to improve the environment and prepare us for climate change, whilst providing the water needed to supply the region's growing population. It promotes the need for collective action so water is used efficiently across society, whilst we continue to reduce what is lost through leaks and wastage. It will make our water supplies more resilient to drought and other events.

The future is uncertain. Our plan will be able to adapt to the future that emerges through a mix of options that together provide water supplies that will be resilient and sustainable for years to come. Our emerging plan is focussed on meeting all legal and regulatory requirements, as well as policy expectations, at the most efficient cost. However, our intention is for it to deliver additional benefits to the region and provide wider public value.

In this document we also explain how we will make the transition to a draft best value regional plan over the coming months, which will be published for consultation. It will be used by the water companies in South East England to derive their draft Water Resource Management Plans later this year. These company plans will set out the co-ordinated investment in water resources that each company will need to make once their plans are finalised and agreed by the Government in 2024.

Why are we consulting now?

We are consulting now to give early sight of the big issues we are facing and the emerging solutions that could be needed.

It is a step in an ongoing process of plan development, and not yet a formal preferred plan. Our work so far has included carrying out an initial assessment of more than 2,400 options to identify which should be considered in our regional plan. Through a process of regional investment modelling we have carried out an initial assessment of the most cost-efficient combination of options that could secure our future water supplies.

However, we know that such decisions should not be made on cost alone and the need to consider other factors beyond cost is specified in the Environment Agency's Water Resources Planning Guideline¹. We will, therefore, use a structured process to further develop our plan, so it reflects wider societal expectations and delivers additional environmental benefits using our best value criteria identified by stakeholders and customers. The cost-efficient proposals will be used as the benchmark to understand cost and value when we are developing our best value plan in the next stage of the process.

Within this consultation document we are therefore seeking your feedback on:

- How we have forecasted the region's future water needs to meet the challenges we are facing and how we propose to manage future uncertainties
- The scope and nature of the measures we are proposing to secure resilient water supplies for the future including measures to manage demand as well as the mix of infrastructure developments that has been generated by our cost-efficient analysis.

How can you respond?

We want to hear your views on our emerging regional plan for South East England. The consultation is open until 14 March 2022.

We have a dedicated consultation site where you will find more information about our regional plan. We have provided specific consultation questions at the end of each section of this document.

There is an online survey where you can answer our consultation questions. Please visit:

[Water Resources South East | Homepage \(engagementhq.com\)](https://www.wrse.org.uk/engagement)

Alternatively, you can email us at contact@wrse.org.uk

If you are interested in more technical information, or the reports that support our plan, we have provided a guide at the end of this document.

All our publications can be found at www.wrse.org.uk/library

You can send a response to the consultation to us through the post to:

WRSE Consultation
c/o Adams Hendry Consulting Ltd
Sheridan House, 40-43 Jewry Street
Winchester
Hampshire
SO23 8RY

All consultation responses must be received by 23.59 on 14 March 2022.

This is an interactive PDF document. You can use the tabs on the right-hand side of the page to move to different sections of the document.

¹ *Water Resources Planning Guideline; The Environment Agency, July 2021*

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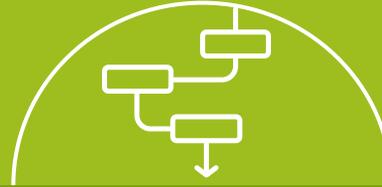


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Welcome from the Chair of Water Resources South East



Thank you for taking the time to read and respond to this consultation which outlines WRSE's emerging plan to address the significant challenges facing all water users in South East England. The size of these challenges may not be apparent, but they are both urgent and significant whilst the solutions to them are both ambitious and complex.

The South East faces the most severe pressure on its water supplies of any region in the country. Our climate is warmer; it is more densely populated with less water per head than some parts of Africa; and it is the home of most of the country's iconic chalk streams that we are seeking to preserve as part of our commitment to improving the environment. The climate emergency is having, and will continue to have, a profound impact on our water environment, so this plan aims to mitigate that by investing in our environment and preparing us for the years ahead by changing how we use water and where we source it from.

This consultation document sets out the impact these issues will have on our water supplies if we fail to act. Such are the extent and gravity of these challenges that they cannot be addressed in isolation by individual water companies, which is why the regional plan has been developed by WRSE. We have worked collaboratively with the water companies to take a fresh and objective look at the challenges facing the region and how best to solve them. Government the water industry regulators and a range of water users and stakeholders are all contributing to the development of this emerging plan upon which we are now seeking views.

The work and proposals contained in this emerging regional plan have been conducted within the boundaries of current/near term policy, the operational licences and responsibilities under which the water companies operate, known and emerging technologies and collaborative approaches across sectors. However, there can be no doubt that in the future, in a world where water availability is challenged further, there is a likelihood that many of these factors will change. New adaptive pathways and opportunities will emerge as water, a vital part of life, is considered on a wider and more holistic basis. The options in this plan have been designed to be flexible to accommodate this as far as is reasonably foreseeable at present.

The solution involves changing how people and businesses' view, and use water, and the development of new water sources to provide it. Through working with the other regions in England, we have for the first time taken a national perspective. This shows opportunities exist to move water between different parts of the country, so that together we make the most of this vital resource and build the country's resilience to drought and other threats.

The investment required to secure safe water supplies for all water users in the region will be significant. Our analysis to date shows that between £15.1 billion to £17.6 billion of investment could be needed by 2060, depending on the future scenarios we face. That said, the cost of not making such investments will be substantially higher in economic, environmental and societal terms. Some of these investment decisions must be made soon if we are to deliver water when and where it's needed.

Water is our most precious resource, there would be no life without it, and we need appropriate and timely investment in how we supply it. At the same time, we are aware of the cost pressures that many households and businesses face and the competing challenges facing the water industry. As we continue our journey to develop our plan we will need to work closely with Government and regulators to establish the right balance of investment, so that we deliver the most value to water users at an appropriate cost to both current and future generations. There is no doubt that trade-offs will have to be made.

This consultation is an important part of that journey and an opportunity for you to contribute your views. We look forward to hearing from you.

Chris Murray MBE



Independent Chair
Water Resources South East



Introduction



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What is a regional plan?

Our plan is one of five regional plans, being developed to meet the country's future water needs.

In 2020, the Environment Agency published the first National Framework for Water Resources² to transform how we plan future water supplies. It requires water companies and other large water users to collaborate across boundaries and, through regional groups, develop plans that consider their region's water needs. These plans should then fit together to provide a joined up national solution.

There are 17 companies that provide public water supplies in England. Each belongs to at least one regional group and are working together to understand how much water is needed in each region and which combination of options will best secure our future water supplies – as well as deliver wider environmental or resilience benefits.

Regional plans will inform the individual water companies' draft Water Resource Management Plans (dWRMPs), which will be published and consulted on later in 2022. These are the statutory plans which will identify the investment needed across England and Wales to deliver more sustainable and resilient water supplies for the future.

You can find out more about WRSE and the regulatory and policy context for our regional plan in the Introductory Annex (sections 1 and 2).

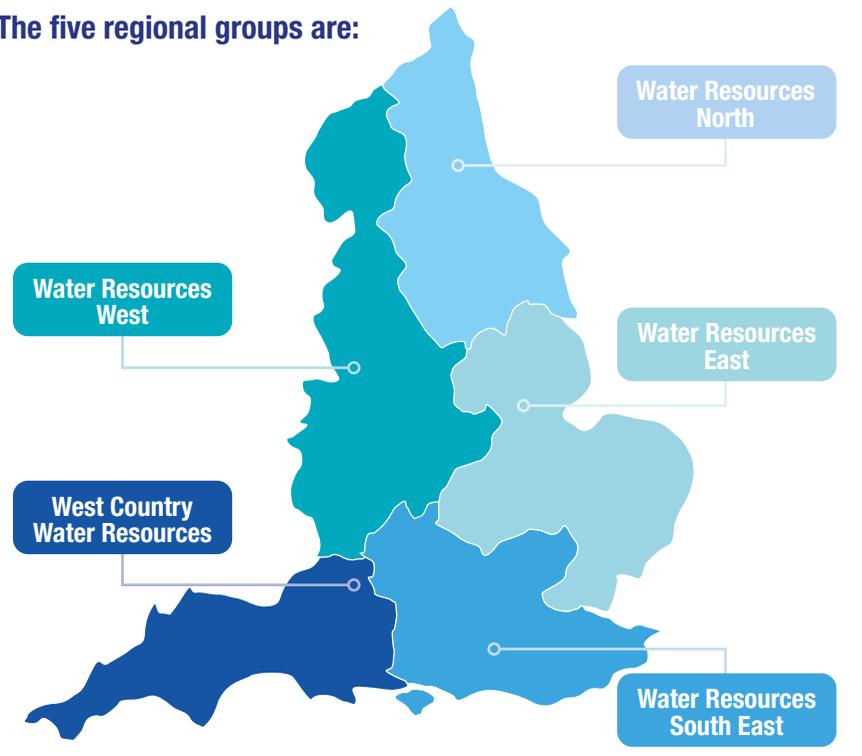
The South East England water companies are:



The WRSE regional plan

Our plan is being developed in collaboration with the six water companies that supply water in South East England, but provides an objective and evidence-based solution to meeting the region's future needs. Instead of each company developing its own water resources plan in isolation and putting them together, we're taking a regional approach that looks beyond the boundaries of individual companies and identifies the options that will deliver the most benefit to people across the region, its environment and other sectors that rely heavily on water. This could result in different options being chosen than if the six companies had developed their plans on their own, including more options that would be developed by one company but provide water to others; and options that could provide water to other users too.

The five regional groups are:



² Meeting our future water needs – a national framework for water resources; The Environment Agency, March 2020

Our water supplies today

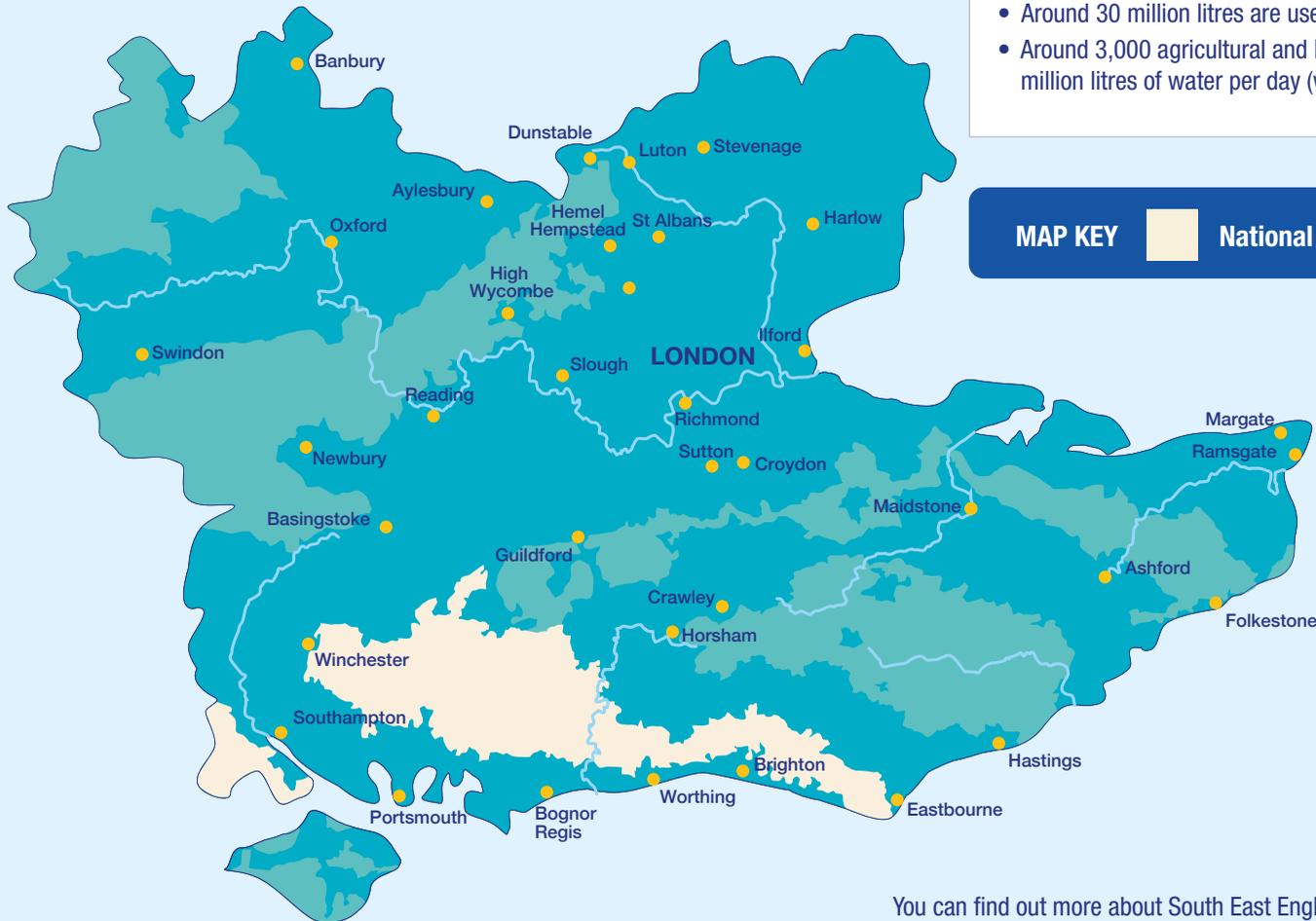
The South East England environment

- 30 river catchments with more than 40 prominent chalk streams*
- Over a quarter of the region is designated as an Area of Outstanding Natural Beauty
- National Parks cover 8% of the region
- There are more than 1,600 Sites of Special Scientific Interest (SSSI)

*As identified by the CaBA Chalk Stream Restoration Strategy

How much water is used today?

- Up to six billion litres of water supplied each day by water companies to 8.2 million homes and 2 million businesses
- Household customers use just over 145 litres of water per person per day
- Businesses use around 18% of the water put into supply
- 97% of water used in the region is by water companies to supply homes and businesses, the rest is abstracted directly by other users
- One major power station in Oxfordshire uses just under 30 million litres of water per day
- Around 30 million litres are used per day to produce paper in Kent
- Around 3,000 agricultural and horticultural businesses across the region together use 77 million litres of water per day (with seasonal variations)



MAP KEY



National Parks



Areas of Outstanding Natural Beauty

Where does our water come from?

- More than half the region's public water supply comes from natural underground sources, the rest comes from rivers and springs
- 27 reservoirs that store water across the region
- One desalination plant in London, that provides water during droughts
- Nearly 400 million litres of water per day is moved in total around the South East water resource zones and between the WRSE and WRE regions
- 115 million litres of water per day is transferred directly between the South East companies
- There are over 82,000 km of water pipes across the region

You can find out more about South East England's water supplies in the Introductory Annex (sections 3 and 4).

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The Challenge



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Why do we need to futureproof our water supplies?

The water sources we rely upon are under threat from climate change. In the future many of them won't provide as much as they do today, meaning there will be less water available to supply people, support the economy and provide healthy environments where wildlife can thrive.

We are looking ahead to understand the long-term needs of the rivers, streams and underground sources that provide these important habitats and the water we all use. This includes forecasting where water companies and other abstractors might need to take less to help protect the environment for the long-term and enable it to adapt as the climate changes. The location and size of these reductions is a key consideration for this regional plan as that water will need to be replaced by other sources.

At the same time, we will also need to supply water to more people, as the population of South East England continues to grow. This plan aims to identify the options that will provide the water needed for the future and increase the resilience of our water supplies, so they don't fail during severe droughts and other events that could affect the region.





How much extra water do we need in South East England?

We've looked 75 years ahead to understand how much extra water we are likely to need to make our water supplies more resilient to drought and address the three main challenges we face – a growing population, climate change and the need to deliver long-term improvements to the environment.

We don't know exactly what the future holds as the further ahead we look the more uncertain it gets. However, we have developed detailed forecasts using the most up-to-date information to help us understand how these challenges could impact our water supplies.

Population growth

We've developed a range of scenarios to project how much water could be needed to meet future population growth. The Water Resources Planning Guideline¹ requires us to plan for the housing growth set out in local authority housing plans, but we also need to consider other factors including housing completion rates and the impact of future immigration policies in case the rate of growth is faster or slower than planned. The way people use water because of climate change is also considered.

What this shows is that the amount of water that could be needed to meet future population growth by 2060 could range by more than 750 million litres per day, depending on the population growth scenario.

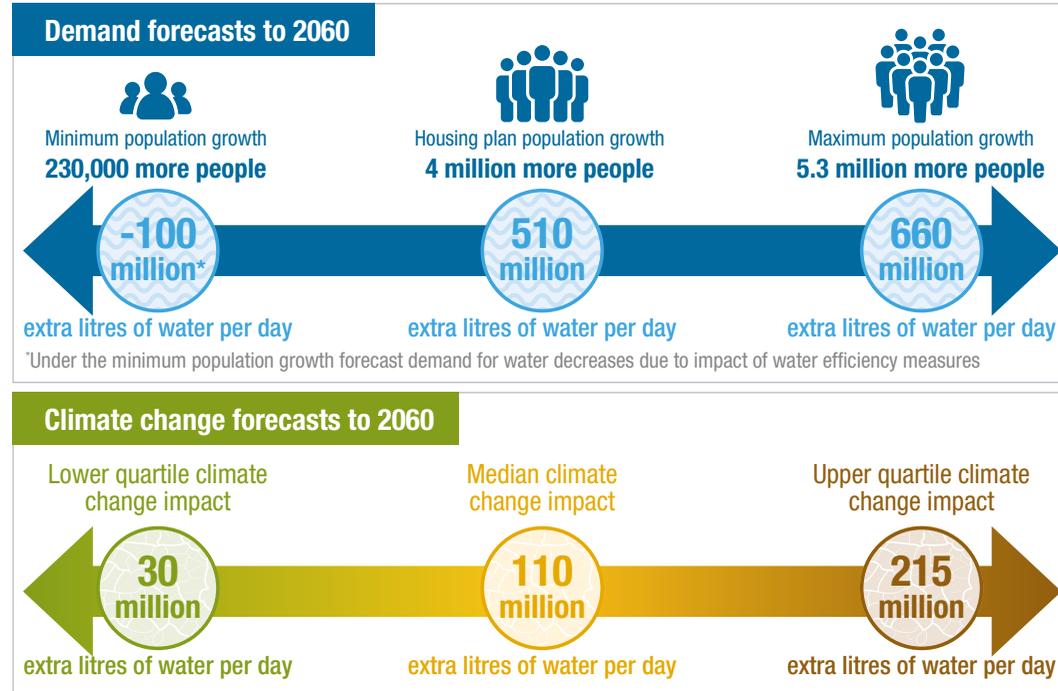
Climate change

We've taken the most recent climate change projections and assessed how they could impact our existing water sources both in normal years and when we experience a drought. This shows us how different climate change scenarios will change the amount of water that is available and helps us identify which water sources are at risk.

To find out more about how we developed our population growth and climate change forecasts visit Annex 1 (section 2).

Increasing resilience to drought

Droughts occur when there is a prolonged period of dry weather and can affect the environment, food and water supplies, as well as impacting on many other industries and the economy. The National Infrastructure Commission³ found that nationally there was a one in four chance of a serious drought occurring by 2050 and that the cost of emergency measures to avoid water supplies being rationed using standpipes and temporary cuts in supply would be in the region of £40 billion. In 2020, the Government set a new planning requirement for water companies. By 2040, their supplies



must be made more resilient, so serious drought events which require the implementation of emergency restrictions on water use such as standpipes in public areas, only happen once in every 500-years on average. To achieve this, water companies need to make more water available. In South East England, a further 625 million litres per day is needed to achieve this by 2040. Up to 2040, drought orders and drought permits will be used to achieve the increased level of drought resilience. After 2040 these are no longer used so will be replaced by other options. See page 23 for more details.

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Customers have told us they want a buffer to cope with potential disruption in supplies.

¹ Water Resources Planning Guideline; The Environment Agency, July 2021

³ Preparing for a drier future: England's water infrastructure needs; The National Infrastructure Commission, April 2018

Protecting and improving the environment

In 2018, the Government published its 25-year plan for the environment⁴ which committed to achieving clean and plentiful water by improving at least three quarters of our waters to as close to their natural state as soon as is practicable. The Environment Act (2021) has since been passed into law and provides the legislation to support many of its objectives.

Abstraction, the process of taking water from the environment, is one of many things that can have an impact on the health of our waters. It can affect river flows, wetlands and ecology. If too much water is abstracted, less is available as a habitat for wildlife and pollutants will be more concentrated.

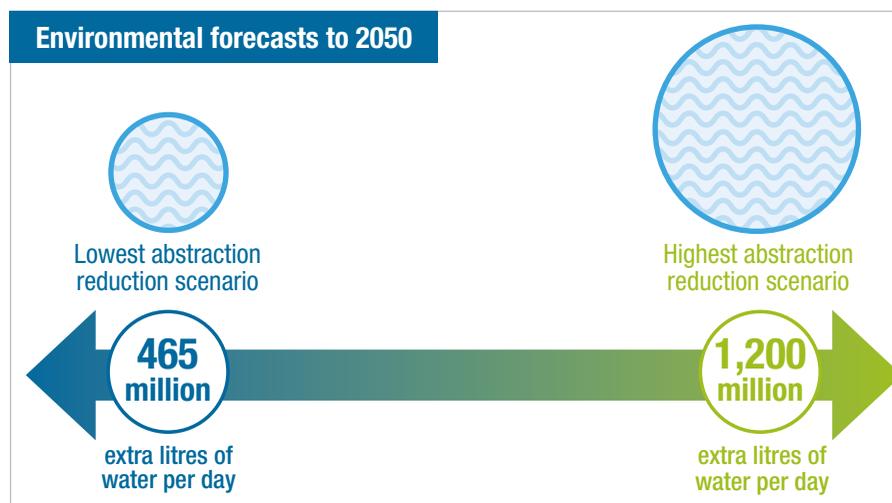
Understanding and addressing the impact of abstraction is a priority for our regional plan. We are looking further into the future to identify where climate change is likely to make existing abstraction damaging and where it may need to be reduced. The impact of abstraction varies in different catchments, and some have areas, for example Sites of Special Scientific Interest (SSSIs), which have enhanced status and specific water requirements.

Water companies are already reducing abstraction through the delivery of the current Water Industry National Environment Programme (WINEP), set by the Environment Agency. By 2030, more than 400 million litres of water will have been returned to the environment by water companies, including to the iconic Test and Itchen chalk rivers in Hampshire.

We are working with the Environment Agency and have produced a range of indicative scenarios which we have used to forecast how much water may be needed to replace unsustainable abstraction beyond 2050. These consider the potential impact of climate change as well as the outputs of previous investigations and assessments.

Our emerging plan identifies the solutions that could be needed to replace these abstractions. The cost associated with delivering this could range from £4.4 billion to £8 billion by 2050.

To find out more about our environmental scenarios visit Annex 1 (section 3).



Customers have told us our plan should protect and have a positive impact on the environment.

Understanding environmental benefits

Further work is needed to better understand the environmental benefits that reducing abstraction will deliver. This requires continued collaboration with the Environment Agency and Natural England and the development of a consistent approach to measuring environmental benefits through the Water Industry National Environment Programme (WINEP), so we can quantify the improvements delivered and the interaction with other areas, such as activity to improve flood risk. This will

help us better understand the return on investment that we are likely to see when we reduce abstraction. It will also enable us to compare the environmental impact of reducing abstraction with the environmental impact of developing the new schemes and water infrastructure that would be needed to replace the water no longer available. Without this comparison we may end up addressing one environmental problem but causing another one elsewhere.

⁴ A green future: Our 25-year plan to improve the environment; HM Government, January 2018



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Prioritisation of environmental improvements

The need for long-term protection and improvement of the environment through reducing abstraction is likely to be the single biggest driver of investment in water resources over the next 25 years.

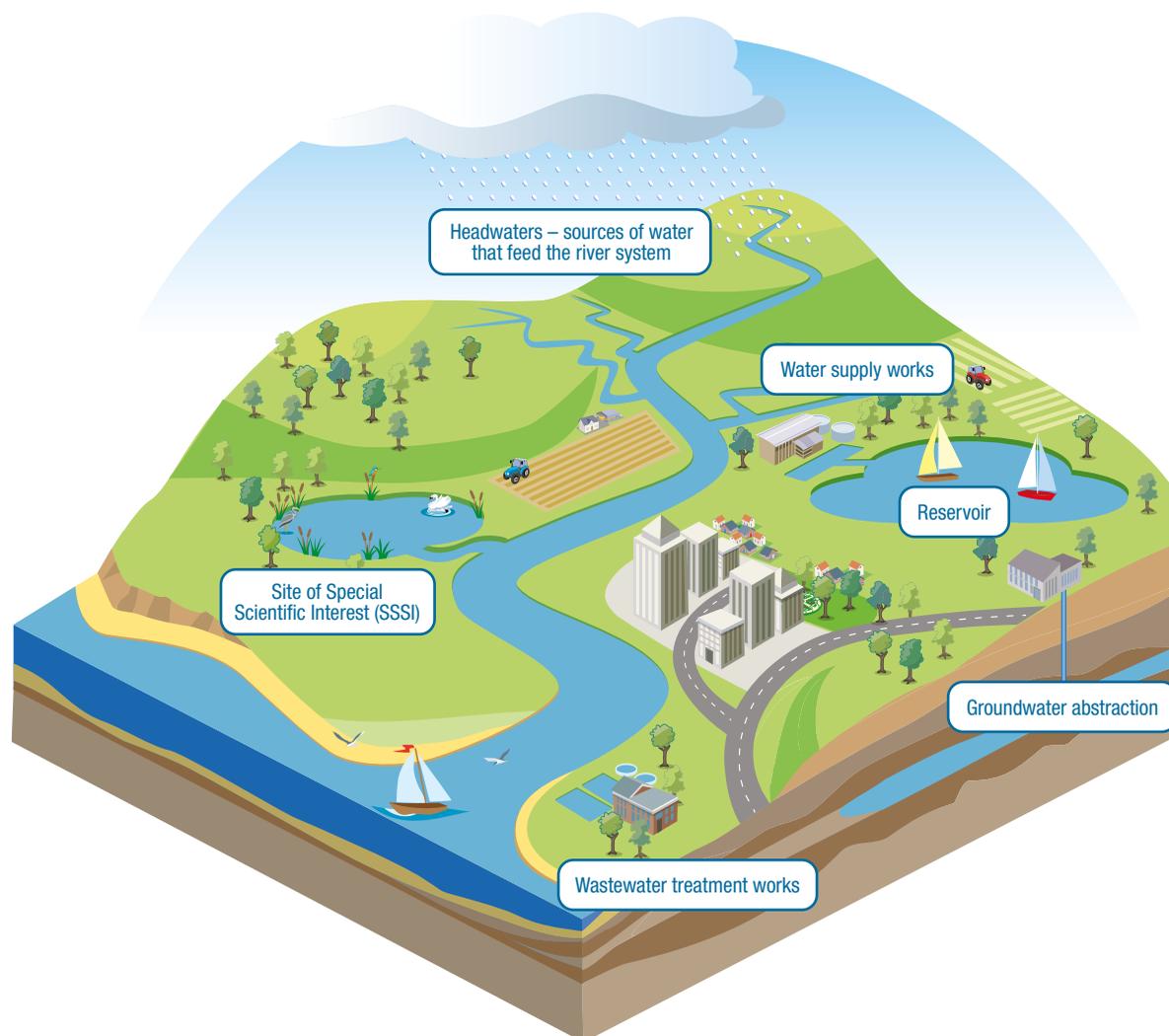
It will need to be included in water companies' future investment plans alongside activity to upgrade ageing infrastructure and address the impact of combined sewer overflows, all of which will need to be paid for and could have an impact on customers' water bills.

We are committed to improving the environment, but we need to agree the pace at which abstraction can be reduced and how we prioritise where reductions should be made. This is so that activity and cost can be phased across the planning period and customers' supplies are not put at unnecessary risk. This is essential as some of the options needed to replace these water sources will take many years to plan and build and decisions on whether we develop them must be made soon.

We are working with the Environment Agency, Natural England, the Catchment Based Approach (CaBA) chalk stream restoration group and environmental organisations to develop a framework to determine where abstraction reduction should be prioritised. This will include considering whether we:

- Prioritise upper catchments, because headwater ecologies are the most vulnerable and the benefits to flow should improve the whole catchment
- Prioritise catchments where the impacts on flows are the most severe
- Prioritise catchments where there is the highest degree of certainty that abstraction reduction will restore flows and deliver environmental improvement
- Prioritise catchments where people have the most unrestricted access to rivers and streams
- Prioritise catchments where nature will benefit most, even if public access is restricted
- Focus abstraction reductions on a smaller number of catchments but fully address the issues they face
- Focus on a wider range of catchments and partially address their abstraction issues.

Furthermore, our regional plan includes activity that will help us better understand how making other improvements in our catchments, such as the use of nature-based solutions like river restoration, could deliver wider benefits. A more integrated approach that combines abstraction reduction with measures to improve water quality and flood risk could deliver better outcomes for our rivers at a more efficient cost, helping us to strike the right balance between environmental improvement and cost to customers.



Read more about catchment and nature-based solutions within our plan on page 23.

We'll continue to work with the Government and regulators to determine the appropriate level of abstraction for the long term, based on evidence of the benefits it delivers, so that it can inform the long-term investment decisions needed to improve the environment.

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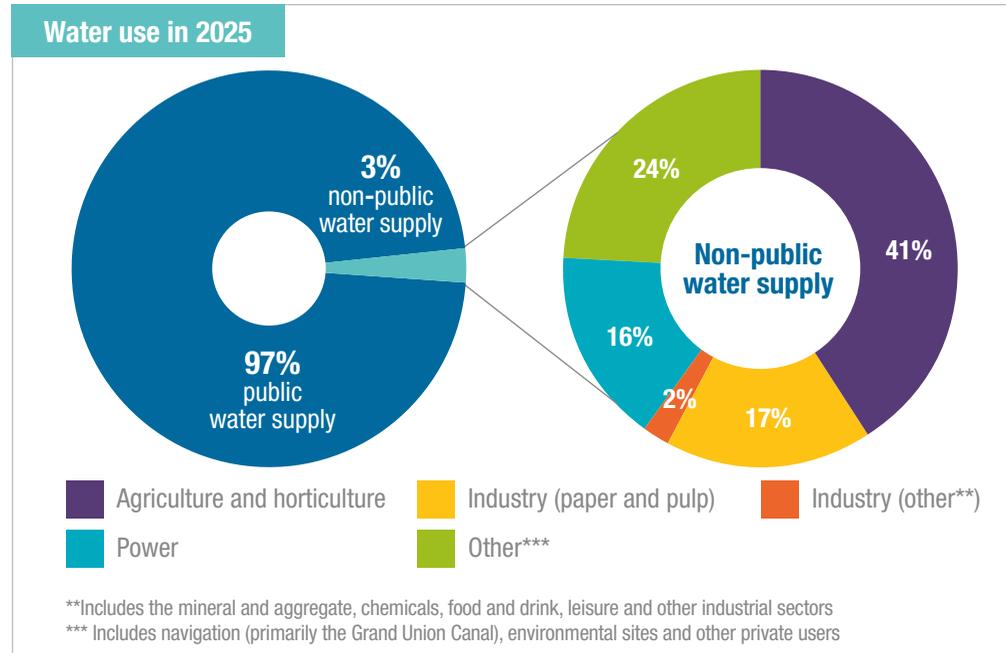
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Understanding the needs of other sectors

Water companies are not the only users to abstract water from the environment. Many other sectors have abstraction licences for the water they need to produce their products and deliver their services. In South East England, about 97%* of the water abstracted is used by water companies to supply homes and businesses. The rest is predominantly used to generate power, by agriculture and horticulture, and to produce paper in certain areas of the region.



We've worked with the main water-using sectors in the region to understand their future water needs and how resilient their existing water supplies are to serious droughts.

The Environment Agency's National Framework² set the requirement for regional groups to consider the needs of other sectors in their regional plans and it provided an initial assessment of other sectors' demand for water. We've developed this further by including abstraction that was not included in its assessment but is in the process of being reviewed and licensed by the Environment Agency. This includes activity such as trickle irrigation which is used by many horticultural businesses and is prominent in the region.

*Consumptive abstraction only (Environment Agency abstraction return data)

² Meeting our future water needs – a national framework for water resources; The Environment Agency, March 2020

We have identified that nearly 100 million litres of additional water could be needed per day by 2060, primarily by the power and paper industries, and some horticultural users for trickle irrigation. Through our engagement so far with these sectors they have indicated that they can meet most of this increased need using their existing licences, by becoming more efficient and by increasing on-site storage. However, the paper and energy sectors have requested that 30 million litres is included in the regional plan and delivered through options that could benefit other sectors. We will continue to work with the other sectors to incorporate their future needs into our regional plan.

To find out more about our multi-sector demand forecast and resilience assessment visit Annex 1 (section 4).



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How we are planning for an uncertain future

The forecasts we have produced enable us to look ahead so we can provide a secure water supply in the right place at the right time. However, the further ahead we look the more uncertain the future is. To help us make the right investment decisions we are taking an adaptive planning approach.

What this means in practice is that we've looked across a wide range of scenarios that we might face over the next 75 years. We've split the planning period into three phases and set out nine pathways. Each pathway reflects a different future scenario, made up of different combinations of population growth, climate change impacts and levels of abstraction reduction so we can see how much extra water will be needed under each.

For the first 15 years, where there is most certainty, we've chosen a central pathway which is most representative of the full range of planning scenarios between 2025 and 2040. It is the period where we must increase the resilience of our water supplies to a one in 500-year drought, so it includes the extra water needed to achieve that outcome too. It also provides a glide path to achieving the full range of abstraction reduction scenarios identified by 2050, if required.

After 2040, the plan splits into three alternative pathways that cover a wider range of possible scenarios we might face. It's during this period that we'll need to reach the agreed level of abstraction reduction for the environment so it enables us to see which options would be required, depending on how much water needs to be left in the environment. At this stage we've not chosen a specific pathway from 2040 but are treating each of the three pathways as equally likely.

From 2060 the plan splits further into nine pathways, reflecting the greater level of uncertainty. During this period, it is currently population growth and climate change that will drive the

amount of water required, however policies that are introduced in the future will also need to be incorporated when they are identified. We don't cover these in this document but they can be found in Annex 1(section 5) and Annex 4 (section 9).

By taking this approach we can see a wide range of scenarios ahead of us from 2025 to 2100, identify all the potential options that might be needed and where we might need to change the suite of options we choose to deliver, as we move from one pathway to another. This approach allows us to take action sufficiently early for the region to adapt to the more challenging scenarios as they emerge, and develop schemes in a way that minimises the risk of unnecessary investment. We will work to ensure our approach will support the adaptive planning pathways proposed by Ofwat for the 2024 business plans.



Customers have told us they would prefer a plan that has the flexibility to deal with future changes.

It is currently proposed that the regional plan will be updated every five years and alongside it we will have a monitoring plan to keep track of what has been delivered so we can update our projections and identify if, and when, we need to move to one of the different pathways.



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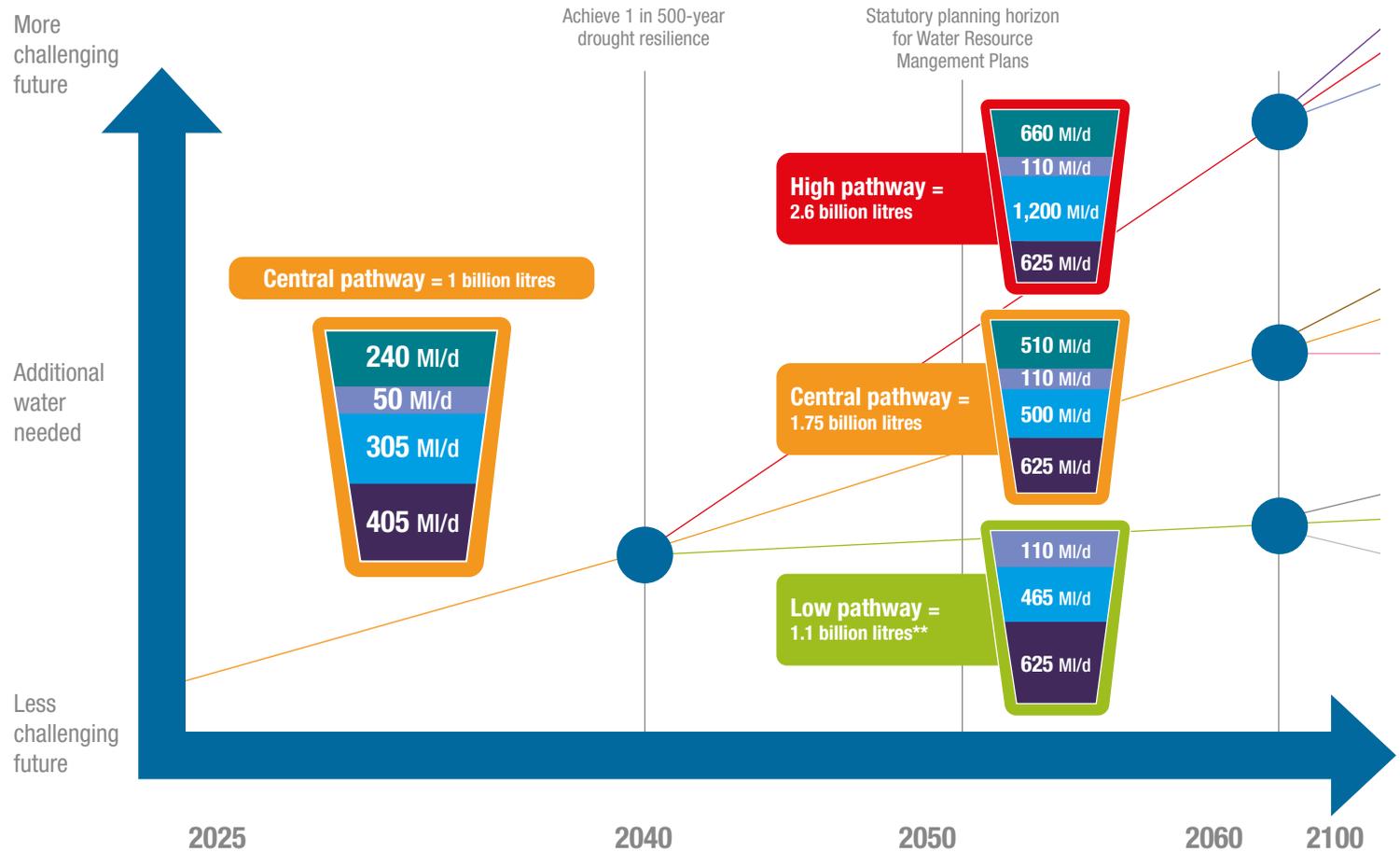
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Our adaptive planning approach

This is the adaptive planning approach we have used to develop our emerging regional plan. It shows the range of future scenarios included in each pathway and the amount of additional water that may be needed to secure water supplies for the future.

What we are planning for (million litres per day is represented by MI/d)



Key

- Population growth
- Climate change
- Abstraction reduction
- Drought resilience (1 in 500-year)*

*Increased drought resilience is achieved by 2040 using drought orders and drought permits. After 2040 these are no longer used which is reflected in each scenario. For more information see page 23.

High pathway: population growth of 5.3 million people by 2060 (maximum scenario)

Central pathway: population growth of 4 million people by 2060 (housing plan scenario)

Low pathway: population growth of 230,000 people by 2060 (minimum scenario)

All pathways use the median climate change projection.

**This takes into account the lower demand forecast due to the impact of water efficiency measures (-100 MI/d)

For more information on how we have developed and chosen our adaptive pathways and to see the pathways to 2100 please visit Annex 1 (section 5).

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Section one – consultation questions

The following questions relate to the future challenges we face and our approach to addressing them.

- Q 1.** Abstraction reduction to protect the environment is likely to be the single biggest driver of investment in water resources over the next 25 years. Do you agree with our approach to establishing the appropriate level of abstraction reduction required across South East England? Please explain your answer.
- Q 2.** We'd like to hear your views on how we prioritise where abstraction is reduced. Please score the following criteria from 1 to 7, with 1 being the least important and 7 being the most important:
 - 1. Prioritise upper catchments, because headwater ecologies are the most vulnerable and the benefits to flow should improve the whole catchment
 - 2. Prioritise catchments where the impacts on flows are the most severe
 - 3. Prioritise catchments where there is the highest degree of certainty that abstraction reduction will restore flows and deliver environmental improvement
 - 4. Prioritise catchments where people have the most unrestricted access to rivers and streams
 - 5. Prioritise catchments where nature will benefit most, even if public access is restricted
 - 6. Focus abstraction reductions on a smaller number of catchments but fully address the issues they face
 - 7. Focus on a wider range of catchments and partially address their abstraction issues

- Q 3.** Are there any other factors that you think should be considered as we prioritise where abstraction could be reduced in the future?
- Q 4.** We have assessed the future water needs of the other sectors that don't rely on the public water supply provided by water companies. Do you agree with our assessment? Please explain your answer.
- Q 5.** We've described our adaptive planning approach and the scenarios we've included in our adaptive planning pathways. Do you agree that we have planned for the right scenarios in each of the pathways with a wide enough range for each of our key challenges through our adaptive planning approach? Please explain your answer.
- Q 6.** Do you support our approach to treat each pathway as equally likely and not choose a core pathway beyond 2040? Please explain your answer.
- Q 7.** Do you have any other comments on our approach to addressing the challenges that are facing South East England?

Visit <https://wrse.uk.engagementhq.com/> to answer the consultation questions.



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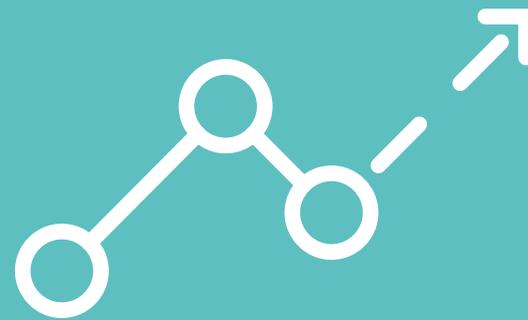
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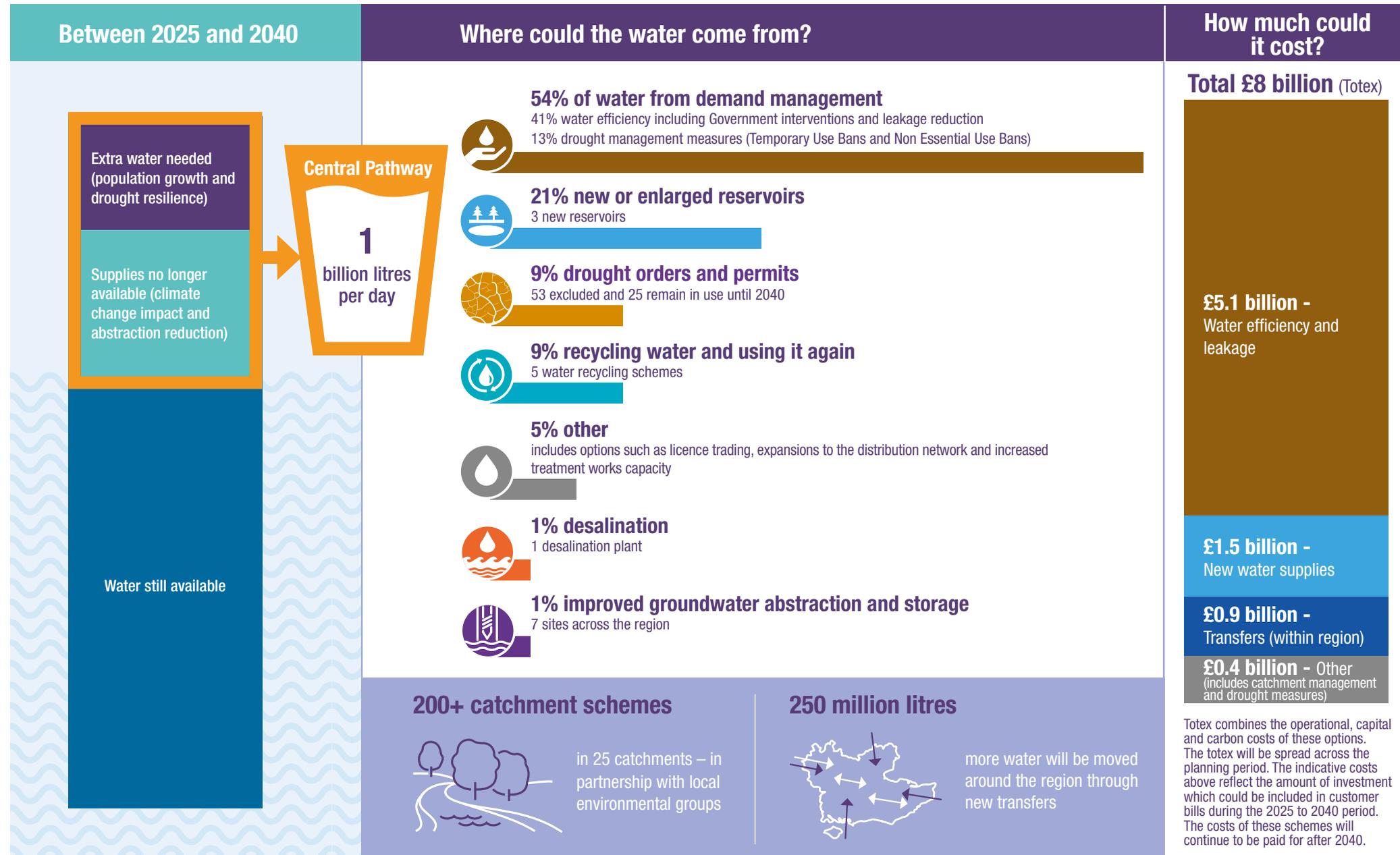
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The South East's future water supplies (2025 to 2040)



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The South East's future water supplies (2040 to 2060)

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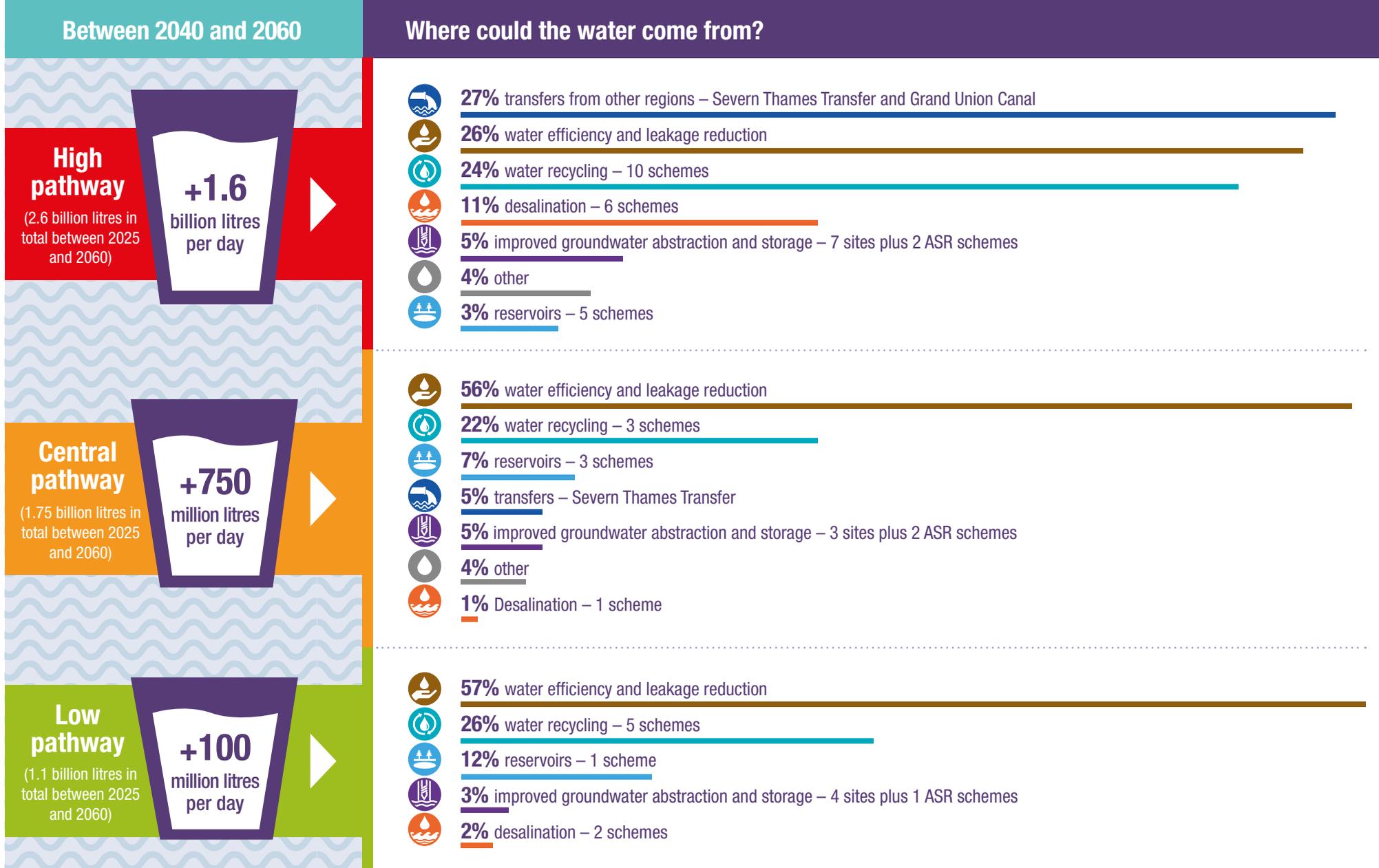


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Our emerging regional plan for the South East

Our emerging regional plan presented in this consultation document is the product of the regional investment modelling carried out to date. It provides an early look at the selection of options that represent a cost-efficient, adaptive way of addressing the region's future water needs and will provide a benchmark against which our best value programme of options will be judged as we further develop our regional plan.

It puts reducing demand for water by tackling leakage and helping people use less at the forefront of activity. Everyone using water in a more efficient way will put our water supplies in a more resilient and sustainable position for the long term and help reduce our reliance on sensitive water sources where abstraction needs to be reduced to benefit the environment.

However, the combined challenges of leaving more water in the environment, population growth and climate change means that we will also need to develop new water sources so there is enough for everyone, including during droughts and other events that can affect our water supplies. The emerging plan identifies a mix of solution types which will provide more resilient and sustainable water supplies.

Our emerging plan for the South East includes four priorities that will safeguard the region's water supplies for the future:

1. Efficient use of water and minimal wastage across society
2. New water sources that provide sustainable and resilient supplies
3. A network that can move water around the region
4. Catchment and nature-based solutions that improve the water environment we rely upon



Customers told us a plan should have a balance of measures to reduce demand and increase supplies.

In this consultation we've presented the shortlist of schemes as they have currently been evaluated using our adaptive planning approach described in section one. This has identified the most cost-efficient solutions along with an early indication of the dates that the chosen options are likely to be needed. Those in the first 15 years of the plan are required across all future scenarios. After 2040, we have used the three pathways within our adaptive plan to identify which options are needed, depending on the future scenario we face.

The timing and scale of the options will be further evaluated through our ongoing work to identify the best value plan that we will undertake over the coming months.

The total cost (totex) of our emerging plan, which includes the cost to build, operate and the carbon costs of all the options identified is £8 billion between 2025 and 2040 and could range from £15.1 billion to £17.6 billion by 2060* depending on the future scenario. The totex will be spread across the planning period. The indicative costs reflect the amount of investment which could be included in customer bills during the 2025 to 2040 period. The costs of these schemes will continue to be paid for after 2040.

Managing the carbon impact of our regional plan

Water companies have committed to reaching net zero operational carbon emissions by 2030, 20 years before the Government target of 2050.

We estimate that the additional operational activities driven by the plan, combined with the carbon associated with new infrastructure, could produce 14 mtCO2e carbon emissions over the next 50 years. In the next phase of our work we will:

1. Optimise carbon as a best value metric which may bring forward low carbon options
2. Complete an assessment on how emerging technology and innovation may reduce the carbon budget in the future
3. Work with companies, regulators and others on how any additional carbon from the regional plan will be managed in the PR24 process.

More detail on the options included in our emerging regional plan can be found in Annex 2 with the supporting technical data in Annex 3.

**The investment modelling we undertake for our draft best value plan will cover the period from 2025 to 2100.*

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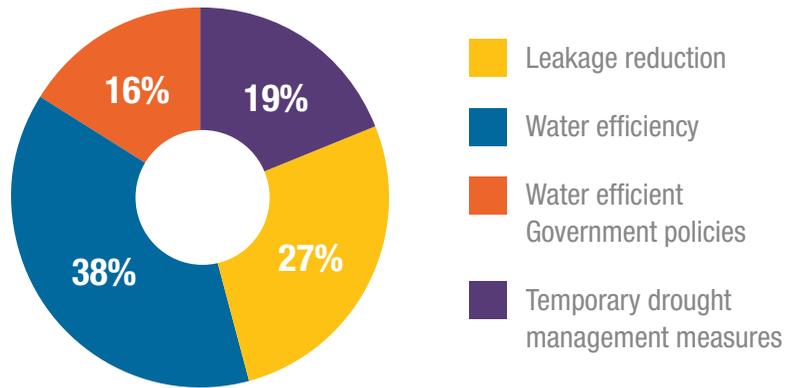
Efficient use of water and minimal wastage across society

Reducing water use is an essential part of tackling the climate and environmental emergency we are facing both nationally and internationally. It will help mitigate the impact of climate change by helping people use water more efficiently, particularly as the population grows, while at the same time cutting the carbon emissions produced by abstracting, treating, moving, and heating water.

The emerging regional plan promotes the need, between 2025 and 2040, for £5.1 billion of investment across South East England to reduce how much water is used and wasted. In the first 15 years of the plan it could provide more than half of the total water needed to secure supplies. Temporary measures that reduce discretionary water use during droughts are also included in the plan. In addition, it identifies the need for the Government to introduce new policies that will deliver long-term reductions in water use across society.

The levels of leakage and water-use reductions in this plan are ambitious but our analysis shows that this increased level of activity, beyond what was committed to by most of the companies in their previous Water Resource Management Plans, is required if more significant reductions to abstractions are needed to protect the environment in the long-term. Delivering them will rely on new approaches and technologies that are yet to be tried and tested, as well as changes to customer behaviour and government policy. Therefore, progress against the plan will need to be monitored closely as if it is not achieved, we risk not having enough water to supply the people of the region and we may need to develop alternative water sources instead. Alternatively, we could develop more new sources of water earlier in the planning period to reduce our reliance on demand management measures.

Percentage contribution of schemes to reduce demand



Over the last 20 years, the amount of water put into supply has fallen by 21 million litres per day despite the region's population growing by 3.6 million, so there has been no net increase in the amount of water being taken from the environment. This is primarily due to the reduction in leakage coupled with water efficiency activity and metering, which companies have successfully delivered since privatisation in 1989.



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How will we reduce the demand for water?



The emerging plan sets out how much total demand for water should be reduced across the region and in each water company area. It gives water companies the flexibility to deliver leakage and water efficiency programmes that best meet the needs of their customers, address the specific challenges of their local areas and use new technologies as they develop.

Leakage

The emerging plan promotes the need for water companies to further reduce leakage by more than 300 million litres per day by 2060, activity could include:

- Finding and fixing leaks faster and more efficiently across their networks using new methods and technology
- Replacing old water mains so there are fewer leaks and bursts and fewer interruptions to service
- Managing the pressure inside water pipes so less water is lost
- Working with customers to identify and repair leaks on their own water pipes.

The leakage activity in the regional plan will mean that all the WRSE companies will reduce leakage by 50% from 2017/18 levels by 2050, a commitment made in 2019.

Water efficiency

The emerging plan promotes the need for water companies to help their customers save more than 400 million litres of water by 2060, activity could include:

- Rolling out meters, including smart devices, to more customers to help them understand and reduce their water use. This includes a proposal for a universal metering programme in Portsmouth Water's area
- Targeting activity and communications to customers about their water use
- Delivering more in-home water-saving visits and fitting products to help save water
- Running public information campaigns to promote water efficiency
- Testing how different tariffs can encourage water efficient behaviour
- Helping customers and businesses to reduce wastage from poor plumbing.

Water efficient government policies

Our emerging plan has identified that the implementation of new government policies is the most cost-effective way to support long-term sustainable reductions in how much water is used across society and to secure water supplies. This includes:

- Mandatory water labelling of water-using products to help consumers make more informed choices about the products they buy and use in their home by 2024 – the Government has committed to this action
- Minimum standards for devices that use water, to remove inefficient products from the market by 2045
- Amendments to the Building Regulations for new homes and retrofits, to deliver more water efficient housing, by 2060.

Our plan relies upon these additional policies being introduced as they could deliver a further 190 million litres of water savings by 2060. Without these policies there is the potential need for up to £3 billion of additional investment in new, less efficient, supply side schemes such as desalination. Implementing these policies sooner could also deliver more savings in the early years of the plan and help reduce the impact on customer bills.

Temporary drought management measures

When droughts occur, water companies take emergency action to reduce the demand for water as part of their Drought Management Plans. This includes introducing Temporary Use Bans (TUBs) on domestic customers and Drought Orders for Non-Essential Use Bans (NEUBs) on business customers, both of which temporarily restrict certain discretionary water-using activities, to help preserve water supplies – for example, washing cars and watering gardens with a hosepipe.

Around 220 million litres of water savings can be made through these temporary drought management measures, and they are included as options within our plan. They are in addition to day-to-day water efficiency activity, although they would only be used when needed and in-line with the level of service each water company has set out in their individual Drought Management Plan.

Water use during the COVID pandemic

Water use can be affected by external factors that influence how much water is used and where. During the Covid-19 pandemic, household demand increased by around 10% while non-household demand fell by around 25% due to lockdowns and more people working at home. In London, the total amount of water being supplied fell by around 3% and remains lower than before the pandemic.



New water sources that provide sustainable and resilient supplies

Our emerging regional plan identifies a number of potential schemes that could provide new water supplies for the future. This is based on our assessment of the feasible options which have then been included in our regional investment modelling to identify the most cost-efficient, adaptive solution. Further details on these schemes and the possible alternatives can be found in Annex 2 (section 5).

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Water recycling



Water recycling is where highly treated wastewater is returned to the environment and used to supplement our natural water supplies. An extra stage of treatment is added at the wastewater treatment works and the highly treated water is transferred to a point on a nearby river or into a reservoir where it mixes with the raw water. Water is then re-abstracted, treated again to drinking water standard and supplied to customers.

● What is in the emerging plan?

The first water recycling schemes that are likely to be needed are in Littlehampton in West Sussex, Beckton in London, Havant in Hampshire, Peacehaven in East Sussex and Aylesford in Kent. Our emerging plan indicates that the water recycling scheme at Beckton is likely to be required before 2040 to meet the need across London and for Affinity Water in this period. The Grand Union Canal option may still represent a cost effective alternative to Beckton. This decision will depend on further work being undertaken for the best value plan that will be published in the summer.



Reservoirs



Reservoirs store water when it is available, typically pumping water from a river or spring when water levels are high, usually during the winter. The water is then stored until it is needed.

● What is in the emerging plan?

Up to 2040, in all scenarios, our emerging plan has identified that two new reservoirs, one in Havant, Hampshire and one in West Sussex could be required to address the short-term water needs in the south of the region. This would be followed by the development of a new reservoir in Oxfordshire, known as SESRO, which is required to support the change to a one in 500-year level of drought resilience and enable more water to be returned to the environment through abstraction reduction. Together these new sources could provide around 325 million litres of water each day. Beyond 2040, a new reservoir could be needed at Broad Oak in Kent as well as using an existing Canal and Rivers Trust reservoir in Brent, London to provide drinking water. Three smaller schemes in East Sussex, Kent and Bedfordshire are also identified.



Transfers from other regions



We have carried out a process of reconciliation with the other regional groups to identify opportunities to share water between regions and provide a more joined up national solution to the country's future water needs.

● What is in the emerging plan?

There are two potentially viable transfers from the Water Resources West region into the South East using the river and canal network. The Severn Thames transfer could move up to 500 million litres of water per day from the North West and the Midlands using the River Severn to Gloucestershire, from where it would be transferred into the River Thames. The amount of water that could be transferred varies under the different scenarios. It could move water from the River Severn, recycled water and water from existing reservoirs. The Grand Union Canal could be used to transfer highly treated wastewater from Birmingham to the northern part of our region.



More detail on the regional reconciliation process can be found in Annex 1 (section 5).



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New water sources that provide sustainable and resilient supplies

Improved groundwater abstraction and storage

Groundwater schemes involve making changes to existing groundwater storage where it is sustainable to do so, or using an innovative technique called Aquifer Storage and Recovery (ASR) to store additional water underground. ASR involves injecting additional fresh water from other parts of the aquifer or from rivers into a confined area within the aquifer. It can then be stored and pumped back to the surface and treated when needed.



● What is in the emerging plan?

There are seven schemes in the early years of our plan to improve existing groundwater storage, without impacting on the environment. Further schemes have been identified after 2040 along with two potential opportunities for ASR in Hampshire and London.

Desalination

Desalination turns seawater and brackish water into drinking water by removing the salt, providing a reliable source of water, including during droughts. There is one large desalination plant in London, and it is a technology that is used extensively in other parts of the world such as the Middle East. Desalination plants can often be expanded to treat more water if needed in the future.



● What is in the emerging plan?

Our emerging regional plan identifies the need for a desalination plant in the Shoreham area of the West Sussex coast by 2040. Further plants may then be needed in other coastal and estuarine locations across Kent and East Sussex, to adapt to more challenging future scenarios.

Alternatives and implications

Our emerging plan has been shown by the regional investment modelling to represent a cost-efficient adaptive way of addressing the region's future water needs. Some of the need in the early years will be largely addressed by the water recycling schemes identified. It will be difficult to replace these without lowering the ambition to return more water to the environment through reductions to existing abstraction. In all scenarios by 2040, the SESRO option is required to assist in achieving the one in 500-year level of drought resilience for London. For the mid to late parts of the planning period, without the development of the large-scale options identified, the water companies cannot fulfil their statutory duties under the more challenging future scenarios.

It could be possible to replace one or two of the large strategic options, such as SESRO and/ or the Severn Thames Transfer, but only under the least challenging future scenario. Doing so increases the cost of the plan by between £1 billion and £2 billion and it will require more water recycling and desalination options to be progressed. This will have a more significant impact on the environment in terms of both the quality of our waters in the case of recycling and the significant additional carbon impact associated with these more carbon intensive options. This will be examined further through our best value assessment and sensitivity testing during the next stage of the regional plan's development.

Water for other sectors

We are considering how we could provide the additional 30 million litres of water per day, if required by the other sectors. This could be achieved by increasing the size of an option, such as a water recycling scheme, and transferring a supply to where it is needed. We are continuing to work with the other sectors to look at options that could address their future needs.

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A network that can move water around the region

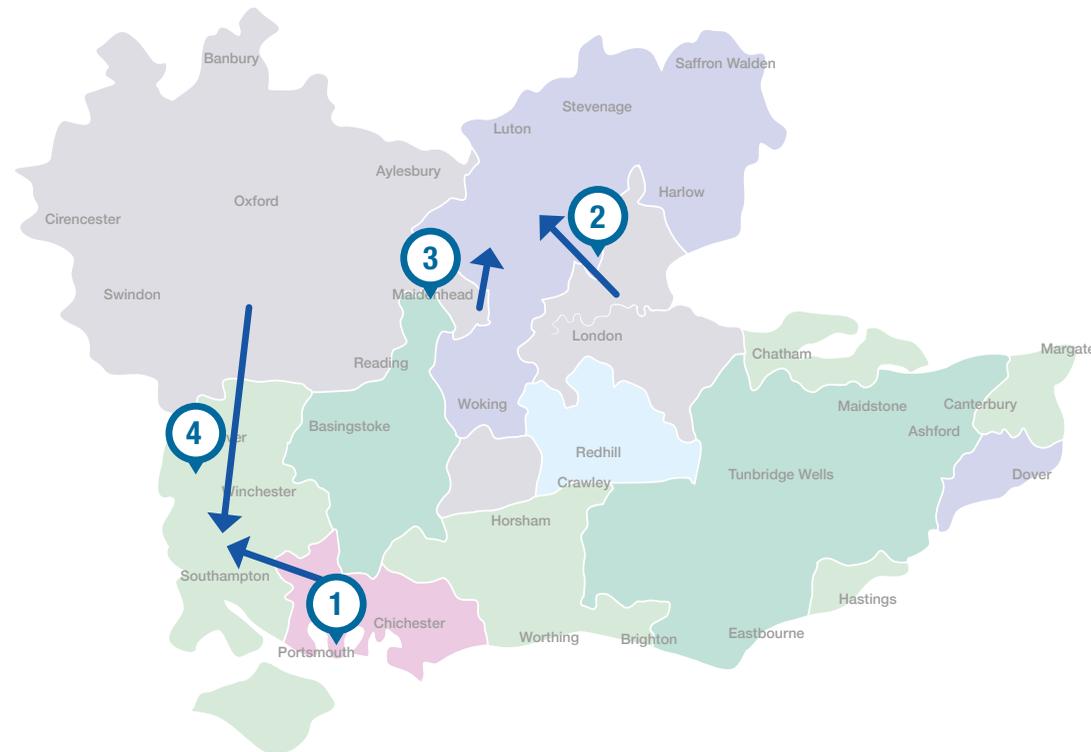
Alongside the options needed to make more water available, the emerging regional plan has identified between £2.4 billion and £3.4 billion of investment in developing new transfers to move water around the South East more easily by 2060, depending on the future scenario we face.

This could see more transfers between different parts of the six water companies' supply areas and between different water companies, increasing the connectivity of the region. These transfers don't produce any extra water, but they do move water from areas where more is available to those where there is less; and they will help make supplies to homes and businesses more resilient as water companies will have more sources to rely upon.

Nearly 400 million litres of water per day can currently be moved around the South East. This could rise to more than 1.1 billion litres per day by 2060 in the most challenging future scenario. The emerging plan has identified some new strategic transfers which would enable water produced by the major schemes to be moved to other supply areas, as part of its cost-efficient assessment.

The strategic transfers in the emerging plan are:

- 1 **Havant Thicket to Southampton** – A pipeline that would move water from Havant Thicket reservoir, in conjunction with the Havant water recycling scheme, to deliver the required quantity of water supply to Southern Water's customers in the Hampshire area.
- 2 **Thames Water to Affinity Water Transfer** – a transfer that would move water produced by the Beckton recycling scheme to a new water treatment works near St Albans to provide water to Affinity Water customers. This scheme would be replaced by the relevant alternative if a different re-use scheme is selected, as described on Page 20.
- 3 **Thames Water to Affinity Water Transfer** – a transfer that would move water from the River Thames to a water treatment works in Iwer to supply Affinity Water's customers in that part of Buckinghamshire. It would transfer water from both SESRO and the Severn Thames Transfer.
- 4 **Thames Water to Southern Water Transfer** – a transfer that would move water from the River Thames to a water treatment works near Southampton, from where it would be used to supply Southern Water's customers in Hampshire. It would transfer water from both SESRO and the Severn Thames Transfer.



All these schemes are being investigated through RAPID's gated process. For more information on all the Strategic Resource Options (SROs) see page 32.

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Catchment and nature-based solutions to improve the water sources we rely upon



The South East water companies abstract water from 28 river catchments across the region along with other users who have their own licences to abstract the water they need. Improving these catchments is a priority for the regional plan to ensure the ongoing quality and quantity of our water supplies, and to deliver wider benefits to the environment and help it adapt to climate change.

The emerging plan has identified more than 200 catchment and nature-based solutions which could be delivered across 25 of the South East's catchments. Our early estimate of the cost to deliver these solutions is in the region of £350 million by 2040. The majority of these schemes do not form part of our cost-efficient solution and may only produce a relatively small amount of water. However, we have included them because they could help the environment become more resilient, while enabling abstraction to continue at a sustainable level.

The nature-based schemes in our emerging plan include the following activities:

- River restoration
- Nutrient and sediment reduction
- Integrated catchment management
- Working with farmers to improve land management practices
- Water retention measures such as natural flood management and wetland creation
- The creation and management of terrestrial habitats
- Sustainable Drainage Systems (SuDS) schemes.

Our member water companies will further investigate these options in partnership with local catchment groups and other water users to identify which should be progressed and funded through their business plans.



The use of Drought Orders and Drought Permits

During droughts, water companies can apply for temporary drought orders and drought permits on certain water sources that allow them to temporarily abstract more water or abstract at a different time of year to help them supply customers if the drought becomes more severe.

The South East water companies and the Environment Agency reviewed the impact of the 78 drought permits and orders available to them and have excluded 53 from the regional plan because of the potential impact they would have on the environment.

The remaining 12 drought orders and 13 drought permits will continue to be used as options in the early years of the plan until the region reaches one in 500-year drought resilience by 2040. The most significant of the drought permits and orders in the plan are those in the Test and Itchen catchments where Southern Water has already reduced its abstractions during a drought by more than 180 million litres per day. There are options being developed to replace this water but, in the meantime, they will need to be used should a drought occur.

After 2040, drought orders and drought permits will only be used in our plan if we experience a drought more serious than a one in 500-year event with monitoring and mitigation measures agreed with the Environment Agency and Natural England to help protect the environment. They have not been included as options after 2040 in our emerging regional plan.

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Section two – consultation questions

Section two sets out our proposed solution to secure resilient and sustainable water supplies for the future, based on our cost-efficient adaptive approach and we'd like to hear your views.

- Q 8.** Reducing the demand for water through leakage and water efficiency activity contributes to more than half of the total amount of water needed in the first 15 years of the emerging plan, the balance then shifts to include a greater reliance on supply side solutions, particularly in the more challenging future scenarios. Water companies are committed to delivering these reductions, but they are reliant on customers making sustained reductions in their water use over the long-term. Do you think our plan strikes the right balance between demand and supply solutions and the risks associated with delivery of such solutions? Please explain your answer.
- Q 9.** The plan assumes that the Government will introduce new policies that will support more efficient use of water across society through labelling of water-using products by 2024, introducing a minimum standard for all water using products by 2040 and tightening the water efficiency requirements within the Building Regulations for new homes by 2060. Do you support these interventions and the timing of their introduction? Please explain your answer.
- Q 10.** Do you think it is appropriate for Temporary Use Bans and Non-Essential Use Bans that reduce demand for water further during droughts to be used as options in this regional plan?
- Q 11.** Do you agree with the mix of options that provide new water supplies for the region within our plan (reservoirs, desalination, water recycling, new transfers, improved abstraction from groundwater storage and ASR schemes). Do you think that some options should feature more or less in our plan to secure future water supplies? Please explain your answer.
- Q 12.** Do you support the use of new, potentially long pipelines to move water around the region?
- Q 13.** We have identified where water companies might investigate a number of new, more innovative nature-based solutions to improve the region's water catchments. Whilst these options can provide multiple benefits the fact they are still relatively new can make it more difficult to be certain of the benefits that will be delivered and the return on investment. Do you agree that we should promote new, more innovative nature-based solutions in our plan to develop a better understanding of their future value and role in delivering water supplies and wider environmental improvements?
- Q 14.** Do you support our approach to stop using the majority of Drought Orders and Permits, only continuing to use a limited number during droughts until we achieve one in 500-year drought resilience and stopping their use after 2040 unless we experience a drought more severe than a one in 500-year event?
- Q 15.** Overall do you agree that the emerging plan, which presents the most cost-efficient adaptive planning solution, should be used as the basis to further develop our draft best value regional plan?

Visit <https://wrse.uk.engagementhq.com/> to answer the consultation questions.



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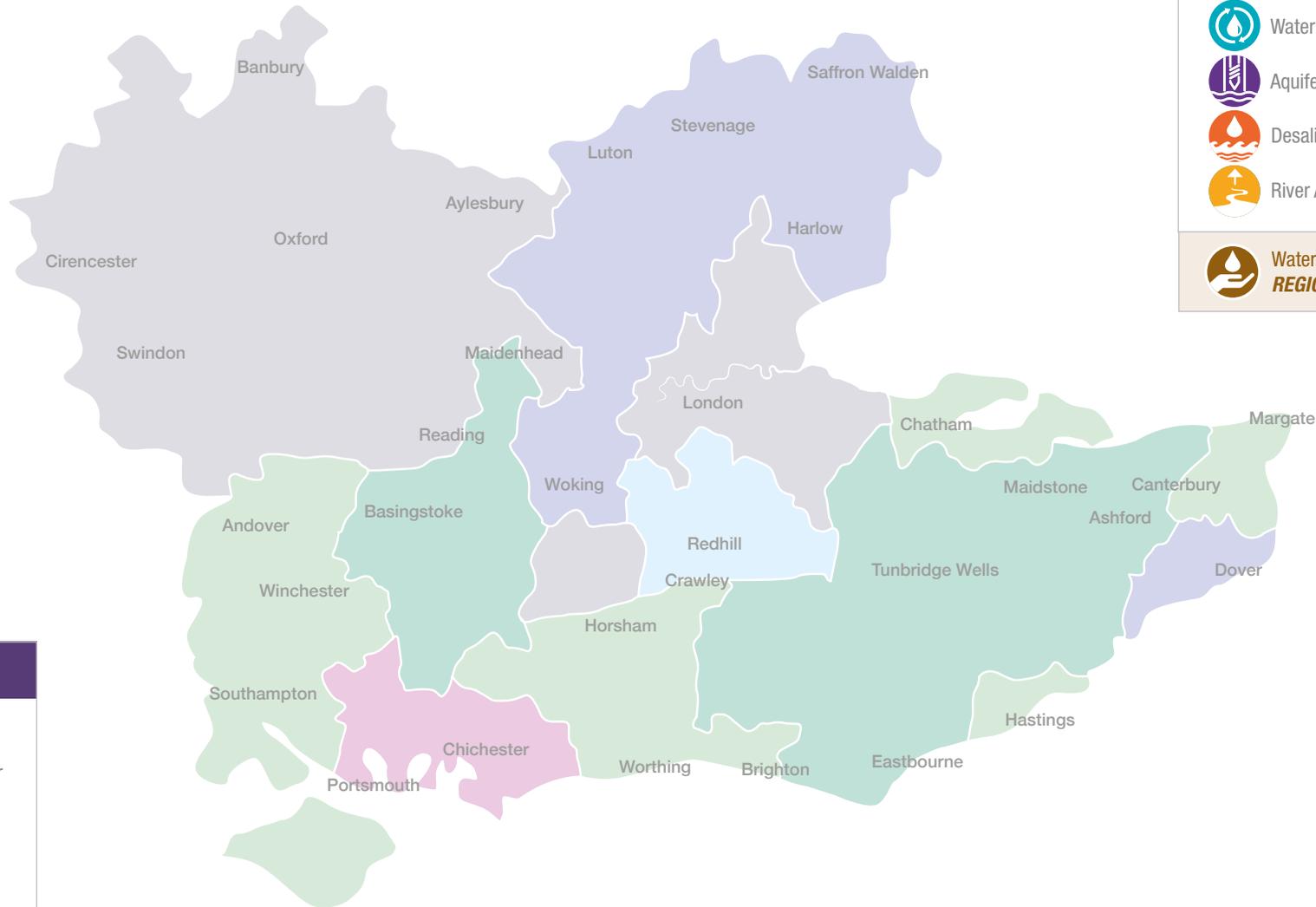
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Our emerging regional plan 2040 to 2060

This map shows the location of the potential schemes identified in our emerging regional plan.



KEY

- Transfer from other Region
- Reservoir
- Water Recycling
- Aquifer Storage Recovery
- Desalination
- River Abstraction
- Water efficiency and leakage**
REGION WIDE

WATER COMPANIES

- Affinity Water
- Portsmouth Water
- SES Water
- South East Water
- Southern Water
- Thames Water

KEY

- High scenario
- Central scenario
- Low scenario

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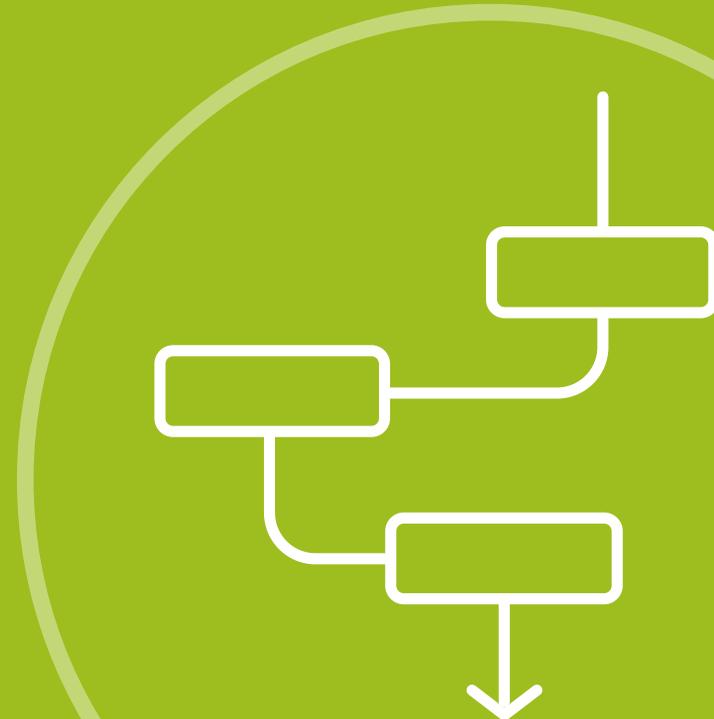
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How we are developing our regional plan

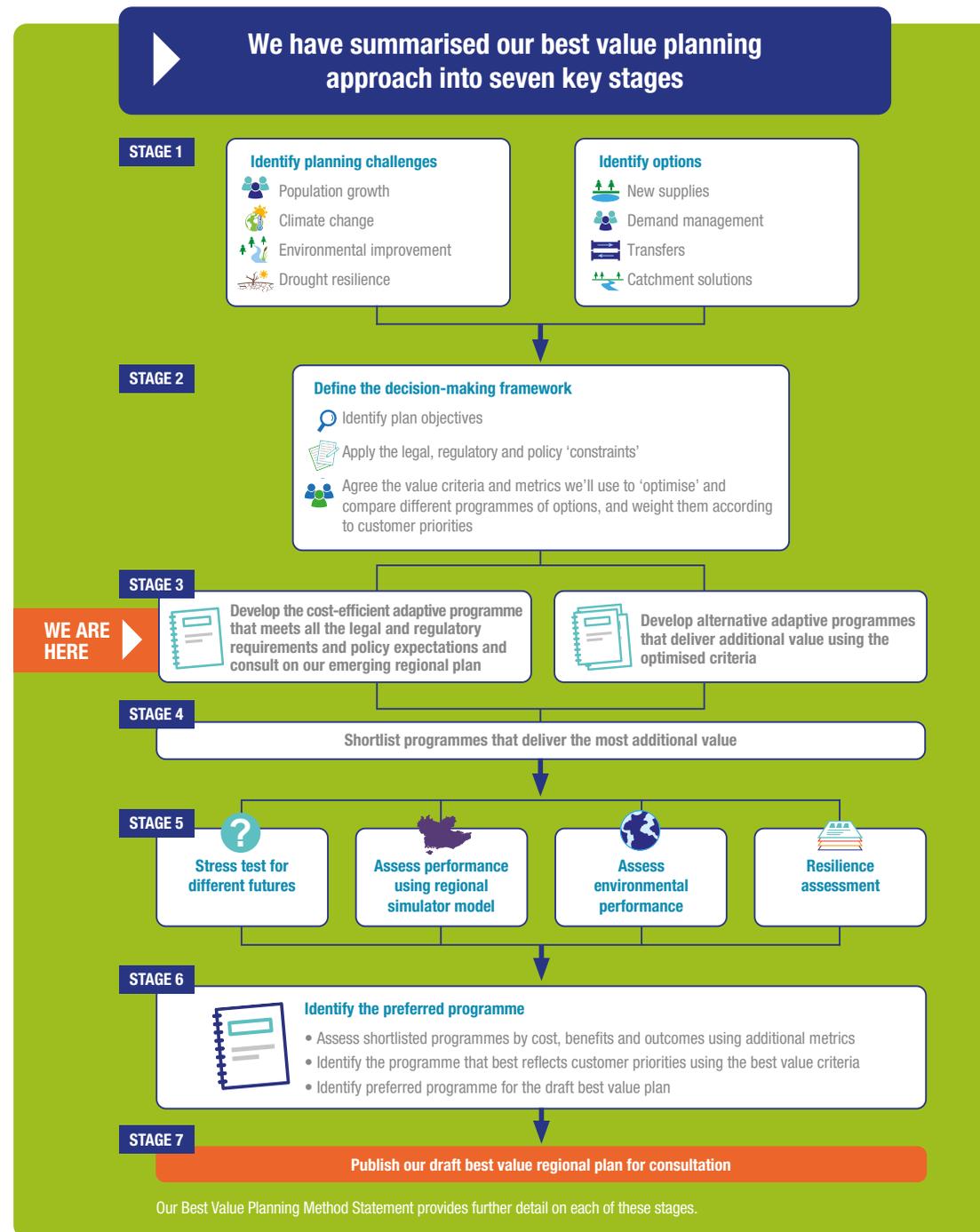
We've worked with the WRSE member water companies, the water industry regulators, water companies in other parts of the country, customers, and a range of stakeholders to develop our emerging regional plan.

Our role has been to look at South East England as a whole, beyond the boundaries of the individual water companies, to identify how we provide the water needed by the whole region in the future. We've used the best available evidence to understand how much water the region will need and when, and which options there are to deliver that water.

All this information was put into our purpose-built regional investment model. The model identified the options that provide water in the right place at the right time and deliver all the legal and regulatory requirements and policy expectations at the most efficient cost. This is the emerging regional plan we have presented in this consultation.

Our next step is carry out further assessments of our options and consider factors beyond cost. This will enable us to identify whether we can deliver additional value through our plan that will further improve the region's environment and benefit wider society. This could mean some alternative options are chosen as they deliver greater value to the region, albeit this could come at a higher cost. Later in 2022 we will publish and consult on our draft best value regional plan, in line with the requirements of the Water Resources Planning Guideline¹, which will in turn inform the Water Resource Management Plans (WRMPs) of our member companies.

Here we show an overview of how we are developing our best value regional plan. More information on this can be found in Annex 4.



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¹ Water Resources Planning Guideline; The Environment Agency, July 2021



How customers and stakeholders are shaping our regional plan

We are using insight from customers and stakeholders to help us develop our regional plan. This includes:

- Working with local authorities to help us forecast how many people we will need to supply water to in the future
- Understanding the future water needs of businesses and the other sectors that use water within our region
- Identifying new options to be included in the plan that have come from other sectors, catchment partnerships and the supply chain
- Consulting on the technical methods and regional policies we've used to develop our plan
- Working closely with the Environment Agency to identify the range of environmental ambition scenarios that have been considered in our plan
- Research with customers of our six member water companies to understand their priorities and the types of schemes they would prefer to provide their water supplies
- Using customer insight to develop a score for each option type that reflects customer preferences which will be used to assess each water resource programme
- Consulting on the additional benefits our plan should deliver and how we measure this using our best value criteria
- Research with customers on which of the value criteria are most important to them to help identify the best value plan which delivers the wider benefits they want
- Research with customers on how they'd like us to present our regional plan to them
- Ongoing engagement with regulators to ensure our plan meets all the legal and regulatory requirements and policy expectations

Details of our engagement with stakeholders and customers can be found in Annex 4 (section 2).

How we've worked with the other regional groups

The individual plans produced by the five regional groups must fit together and provide the best set of solutions for the country so that everyone receives resilient and sustainable water supplies, and the environment is improved for the long-term.

We've made sure that our plan aligns with those being prepared by the other regional groups and that has resulted in the identification of opportunities to move water to South East England from the Water Resources West region.

As we continue to develop our regional plan, following the public consultation and beyond, we'll keep working closely with the other regions to check that the water we need from them is still available and can be provided when we need it.

You can find out more about the regional reconciliation process in Annex 1 (section 5).



Linking different planning activities

Throughout the development of the plan we have worked hard to build consistency and alignment between the different water-related planning activities which interact with water resources planning – particularly Drainage and Wastewater Management Plans and Flood Risk management. Whilst we have made good progress and these different planning activities are now more closely aligned than ever before, there is more to do. We will continue to ensure the regional plan meets the expectations for integrated planning which regulators and others have asked us to do.

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How we've chosen our emerging regional plan

Assessing our options

We have considered more than 2,400 options to identify which should be considered in our regional plan. These were put forward by our six member water companies and we also identified new ones, so more options have been considered than ever before. This included assessing:

- ▶ **How much water could be produced** – we've calculated how much water each option will provide during normal years and in a range of different drought scenarios.
- ▶ **Cost** – we've used the most up-to-date cost information so we can understand how much each option will cost to build and run, including the carbon cost of that option.
- ▶ **Environmental performance** – we have carried out an environmental assessment* of each option which has included six elements:
 - Strategic Environmental Assessment
 - Habitats Regulations Assessment
 - Water Framework Directive Assessment
 - Invasive Non-Native Species Assessment
 - Natural Capital Assessment
 - Biodiversity Net Gain Assessment.
- ▶ **Time** – we've considered how long it will take for water to become available from each option.

Resilience – we've developed a new framework to assess the region's resilience to a wide range of shocks and stresses that could impact public water supplies, the water supplies of other sectors and the environment. These scores have not been used for the cost-efficient assessment but will be applied for the draft best value plan.

*WRSE has carried out an environmental assessment and companies will carry out a further assessment as part of the statutory WRMP process which could change the plan.

Just over 1,000 options were rejected because our assessments showed they were too damaging to the environment or were not reliable enough sources of water. There are also a host of options that may be feasible, however further work is required to establish this.

The regional investment model chooses the options that, when combined together, deliver the water required when and where it is needed. Our emerging plan shows which options could provide the water needed, using each of the pathways we identified as part of our adaptive planning approach at the most efficient cost. These options could change as we move from our cost-efficient plan to a best value plan, and as we carry out further assessments.

To find out more about the options that were considered, and the option appraisal process, see Annex 4, (section 4).



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The options we have considered

We put more than 1,400 options into our investment model, some of which can be developed in a range of different sizes depending on how much water is needed. Together these options could provide nearly five billion litres of water per day. They include:



148 demand management strategies which include a range of leakage, metering, and water efficiency activity



12 locations for new reservoirs and one scheme to make an existing reservoir bigger



40 groundwater schemes that will improve how we abstract water from underground



158 transfers within South East England that would move water between the six water companies in the region



16 desalination plants that could turn more than 900 million litres of seawater into drinking water



15 managed aquifer recharge (MAR) and aquifer storage and recovery (ASR) schemes that enable more water to be stored underground



28 water recycling schemes that together would return nearly 900 million litres of treated wastewater to the environment so it can be used again



300 catchment schemes, many of which were identified by local catchment groups and community organisations



16 transfers from other regions of the country that would move water already available, or created by the development of new sources in those other regions, to South East England

We've also looked at options to trade water and at drought options such as Temporary Use Bans, Non-Essential Use Bans, Drought Orders and Drought Permits.

Strategic Resource Options (SROs)

Within our set of options are 15 SROs that are being investigated in more detail by the relevant water companies. Specific funding was allocated in the PR19 business plans to progress work on these schemes through a process being overseen by RAPID – the Regulators' Alliance for Progressing Infrastructure Development. Work is still ongoing to look at the cost and deliverability of these options, but they have all been considered in our emerging plan. If progressed, each will go through the full planning process including further public consultation. We'll continue to work with the water companies to update costs and option information as their work progresses.

Find out more about the RAPID process www.ofwat.gov.uk/regulatedcompanies/rapid

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What options do customers prefer?

We carried out research with more than 2,500 domestic and business customers from across the region to help us understand which options they prefer to supply their water. This research is being used to develop a customer preference score which will be used as part of our best value assessment. Our research programme has been scrutinised by a regional Customer Challenge Group (CCG) comprising CCW (previously the Consumer Council for Water) and representatives from member companies' CCGs where they operate.

Customers expect us to:

- Make the current system as efficient as possible by reducing leakage
- Help them use water as efficiently as possible at home, and use metering and tariffs to encourage water saving
- Deliver wider benefits by making improvements to catchments



They see a role for new resources and would prefer:

- The development of reservoirs to store more water
- Water recycling for household and industrial use
- New transfers within the region to move water around
- Improvements to how water is stored underground



Their least preferred options are:

- Schemes that require more water to be abstracted from the environment
- Desalination
- Drought orders and permits that take more water from the environment



When presented with alternative plans most customers chose a plan with a balanced mix of supply and demand options i.e., ones that produce and save water. You can find out more about the options customers prefer in Annex 4 (section 5) and all our customer research reports can be found at www.wrse.uk/engagementhq.com

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Other factors that could change our emerging regional plan

Our emerging regional plan is based on the best available evidence and data we have at this time but there are some things that could change over the coming months which may result in different options being chosen. We'll reflect any changes in our draft best value plan, which we will publish later in 2022 and explain what has changed and why. Any further changes will also be taken into account ahead of the publication of our final plan in 2023.

Environmental policies

Our environmental regulators, The Environment Agency and Natural England, are considering bringing in new policies to help protect and improve the environment, which will impact on our water resources. These policies include:

- the introduction of caps on existing abstraction licenses based on how much water has recently been abstracted, meaning that some abstractors may no longer be able to abstract their full licensed amount and meet their future growth requirements. This could impact on water companies and other sectors, potentially limiting opportunities to trade water between abstractors
- rules around when water can be transferred to reduce the spread of invasive species which could impact the development of new transfers of raw (untreated) water
- not transferring water if it impacts on the donor region's supply demand balance or if protected sites in the donor region are not meeting the required environmental standards – both of which could impact on transfers between different regions
- higher levels of abstraction reduction which in other regions could mean less is available to be transferred to South East England.

You can find out more about the factors that could change our emerging regional plan in Annex 4 (section 10).

It's important to remember that the regional plan will be updated every five years and will take account of any changes to the future forecasts as well as many other factors such as advancements in technology, government policies affecting the water industry and other sectors, economic conditions, patterns of water use and customers' changing priorities.

Strategic Resource Option costs

The costs associated with developing some of the strategic resource options (SROs) in our plan are currently being investigated by water companies through a process that is being overseen by RAPID. If we see a significant change to the cost of a scheme, it could impact its inclusion within the final regional plan. We'll have a better understanding of costs later in the year and they'll be incorporated into our draft best value plan.

Carbon costs

The water sector has made a commitment to achieving net zero operational carbon emissions by 2030. We have used current Government guidance on carbon costs within our emerging plan. However, it is likely that the Government will increase the cost of carbon in construction projects to promote more low carbon alternatives. This could change the type of options that are included in our final regional plan and the way in which new infrastructure is built.



How we'll identify our best value plan

Over the coming months we and the water companies will carry out further assessments on the options we have available to us, which include additional environmental assessments and consideration of their deliverability.

We will carry out additional investment modelling to develop a number of alternative water resource programmes, all of which will produce the water needed under the different pathways. We will then compare them to this baseline cost-efficient plan using a set of best value criteria.

We have worked with customers and stakeholders to develop a set of best value objectives that are represented by a range of value criteria and metrics. These were subject to consultation in early 2021.

We have also asked customers which of these criteria are most important and we will use these weightings as part of our assessment. The value criteria will be used to measure the wider benefits that the alternative water resource programmes deliver and how much they'll cost.

This process will enable us to develop a draft best value plan for the region, which we will consult on later this year.

Our best value objectives and criteria

Objective	Criteria
Deliver a secure and wholesome supply of water to customers and other sectors to 2100	Meet the supply demand balance – provide enough water for public water supply and other sectors by 2100
	Halve leakage by 2050 and reduce it further beyond 2050
	Reduce how much water is put into supply by water companies
	Options that customers prefer (using customer preference score from customer insight)
Deliver environmental improvement and social benefit	Reduce how much water is abstracted from identified sites and by when
	Environmental disbenefits of the programme (assessed by the Strategic Environmental Assessment)
	Environmental benefits of the programme (assessed by the Strategic Environmental Assessment)
	Enhance natural capital
	Improve biodiversity (biodiversity net-gain score)
Increase the resilience of the region's water systems	The cost associated with offsetting carbon emissions
	Achieve 1 in 500-year drought resilience (date achieved)
	Reliability - how well the water system can cope with short-term shocks without changing how it performs
	Adaptability - how well the water system can adapt so it can accommodate short-term shocks
Deliverable at a cost that is acceptable to customers	Evolvability - how well the system can be modified to cope with long term trends
	Total cost of the programme (using the Social Time Preference Rate)
	Spread the total cost of the programme across present and future generations (using the Long Term Discount Rate)

The opportunity to deliver additional value may be limited when we try to solve the high future scenarios, this is because there are fewer choices to be made between options as so much additional water is needed. However, we expect our best value assessment to have more of an impact on the options that are chosen in the less challenging pathways of our adaptive plan.

The programmes will be shortlisted and stress tested to see how well they will perform in different future scenarios and against a range of environmental and resilience measures. We've also developed a simulation model of the region's water network to check that the options work well together and provide water where and when it is needed.

Further details of how we developed our best value criteria and metrics can be found in Annex 4 (section 7).

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How our plan could deliver extra public value

Water companies provide a vital public service but the investment they make can deliver greater value to society. We have started to consider how our regional plan could contribute more public value across a range of areas, using Ofwat's guiding principles, and we will continue to develop this work in our draft best value regional plan that we publish in summer 2022.

Investment in infrastructure – building resilience for the future



Our emerging regional plan identifies that £18 billion of investment could be needed to deliver safe and resilient water supplies for the future. Work by the Institution of Civil Engineers (ICE) shows that investment in infrastructure can make a positive contribution to economic growth and deliver a range of wider benefits for people, communities and the environment. The ICE report estimates that for every pound spent on water infrastructure, the economy and society receive an extra 55% benefit – an additional £10bn of potential benefits for areas including job, skills and growth.

Tackling the climate emergency – the carbon and social benefits of saving water



Using water more efficiently will save nearly 600 million litres of water per day. However, saving water also helps to save energy as less water needs to be abstracted, treated, moved, and heated. Therefore, the water savings promoted by the regional plan will help the affordability of both water and energy bills, increase the security of both vital services and create significant opportunities to reduce the country's carbon footprint. We estimate 3 MtCO₂e of carbon could be saved – equivalent to 2,000 flights to New York.

Iconic infrastructure for the 21st Century – regeneration of the Grand Union Canal



This scheme involves repurposing this 19th century canal to meet the needs of the 21st century. As well as moving recycled water to the South East, it could create a series of unique recreational and biodiversity opportunities along the 133 mile route through the heart of England. Through working in partnership, this water resource scheme, as with many others, could create a wide range of wider public value benefits such as a unique wildlife corridor between Birmingham and London which co-exists with opportunities for cycling, walking, canoeing and paddle boarding.

Tackling the environmental crisis – protecting it for future generations



The South East is home to some of the country's most vulnerable water ecologies and includes over 41% of the world's chalk streams. The plan could deliver up to £8 billion of investment in the environment much of which would be focused on reducing damaging abstraction in the future. It also promotes a wide-ranging programme of nature-based solutions that will provide wider environmental benefits. A healthy and vibrant natural environment creates a wide range of wider public benefits both for people today and for future generations.

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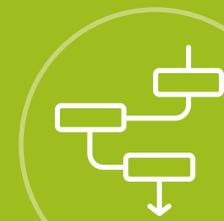
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Our journey so far and what happens next

What we've done so far

2019 – 2021

Preparatory work on our regional plan to develop our future forecasts, identify new options and develop our technical methods

Water companies progressed work on the Strategic Resource Options (SROs) that Ofwat asked them to look at more closely which have been included in our modelling

Consulted stakeholders on our forecasts, technical methods and our best value objectives, criteria and metrics

Listened to the views of customers on the options they prefer and where they want us to deliver additional benefits

Worked with the other regions to identify where water could be moved between regions

Held a workshop with stakeholders on our adaptive planning approach

Carried out extensive modelling that considered a range of future scenarios and identified the most 'cost efficient' water resource programme for the region

Now

2022

Consultation on our emerging regional plan and pre-consultation on the water companies' WRMPs

Customer research on our emerging regional plan and the alternatives

Incorporate updates to the data that water companies have provided

Continue to develop our draft best value plan that delivers wider benefits for the region

Next

2022 – 2023

Consider the feedback we receive and produce a consultation response

Publish our draft best value regional plan for consultation (**Summer/Autumn 2022**)

Water companies will use the draft best value regional plan to inform their draft WRMPs and carry out a public consultation (**Summer/Autumn 2022**)

Companies consider the feedback they receive and update their Water Resource Management Plans, this will include the latest information on the Strategic Resource Options (**Spring 2023**)

Check back with the other regions to make sure all our plans still work together (**Spring 2023**)

WRSE will produce a final best value regional plan (**Spring 2023**)

Companies will produce their final Water Resource Management Plans (**September 2023**)

Companies will produce their five-year business plans which will include the immediate investment needed in water resources between 2025 and 2030

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What happens next?

We have more work to do on our regional plan but before we do, we want to hear the views of our customers and stakeholders. Your feedback will be taken into account as we continue to develop our draft best value regional plan that will be published later in 2022 for consultation and used by companies to inform their draft Water Resource Management Plans (dWRMPs).

Following the companies' draft WRMP consultations, we will update our regional plan again. We'll incorporate the feedback the companies' receive, along with the latest information from the investigations into the Strategic Resource Options (SROs).

We will also reflect any new government and regulatory policies that are introduced between now and then. Our final regional plan will be produced in 2023 ready to inform the final company WRMPs and their 2025 to 2030 business plans which will include the investment needed to secure water resources for the future.



How to respond to our consultation

We want to hear your views on our emerging regional plan for South East England.

We have a dedicated consultation site where you will find more information about our regional plan and an online survey where you can answer our consultation questions. The consultation is open until 14 March 2022.

[Water Resources South East | Homepage \(engagemthq.com\)](https://www.engagemthq.com)

Alternatively, you can email us at contact@wrse.org.uk

For more information

We've produced a suite of technical annexes that support our emerging regional plan consultation so if you are interested you can find out more.

Introductory Annex

Annex 1: The Challenge

Annex 2: The Solution (overview)

Annex 3: Our emerging regional plan (technical data)

Annex 4: How we are developing our regional plan

All our publications can be found at www.wrse.org.uk/library

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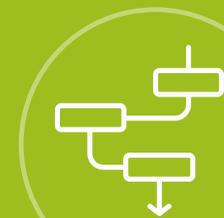
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Abbreviation list and Glossary

Acronym	Term	Definition
	Abstraction	Taking water from the environment (under license from the Environment Agency) for use in the public water supply or industry
	Adaptive planning	<p>Adaptive planning allows us to account for uncertainty, such as different impacts of population growth and climate change, which is useful when planning into the future.</p> <p>For each new plan, we monitor how previous ones have been implemented, what impacted their operation and incorporate new forecasts into modelling. We're then able to adapt future plans to meet different scenarios, based on this understanding</p>
AMP	Asset Management Plan	Five-year water company investment period
AONB	Area of Outstanding Natural Beauty	An Area of Outstanding Natural Beauty is an area of countryside in England, Wales, and Northern Ireland, that has been designated for conservation due to its significant landscape value
	Aquifer	A body of rock and/or sediment that holds groundwater
ASR	Aquifer Storage Recovery	ASR involves injecting additional fresh water from other parts of the aquifer or from rivers into a confined area within the aquifer. It can then be stored and pumped back to the surface and treated when needed
	Best Value Plan	The consideration of non-monetised factors alongside cost to develop a plan that delivers best value
	Business Plan	<p>Water companies develop and submit business plans every five years to Ofwat, the economic regulator.</p> <p>These plans set out the commitments companies make to their customers, and how they will meet them.</p>

Acronym	Term	Definition
CaBA	Catchment Based Approach	An initiative that works with Government, Local Authorities, Water Companies, businesses and more, to maximise the natural value of our environment
	Catchment	The area from which precipitation (rainfall) and groundwater would naturally collect and contribute to the flow of a river
CCG	Customer Challenge Group	A group of independent stakeholders representing different customer groups and scrutinising water companies' business plan development
CCW	Consumer Council for Water	The consumer protection body for water customers in England and Wales
	Cost-efficient	A cost efficient planning process assesses all options which meet both company and WRSE feasibility threshold against whole life delivery costs including the cost of carbon. The resulting plan therefore represents the lowest programme costs to deliver required policy outcomes and core strategic objectives. A cost efficient plan does not include, in its selection process, other benefits, additional value and/or wider objectives.
Defra	Department for Environment, Food and Rural Affairs	UK Government department with responsibility for environmental matters – including water resources
	Desalination	A process where seawater or brackish water is turned into drinking water by removing the salt, providing a reliable source of water, including during droughts
	Demand Management	Measures taken by water companies to support customers to reduce the amount of water they use and reduce leakage

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Acronym	Term	Definition
	Drought Permit	An authorisation granted by the Environment Agency under drought conditions, which allows for abstraction / impoundment outside the schedule of existing licences on a temporary basis
	Drought Order	Powers granted by the Secretary of State during drought to modify abstraction / discharge arrangements on a temporary basis
DWMP	Drainage and Wastewater Management Plan	New statutory plans where wastewater companies take a company-wide approach to managing their wastewater and drainage assets
EA	Environment Agency	The regulator responsible for environmental protection and enhancement
	Groundwater	Water held underground in the soil or in voids in rock (see aquifers)
GUC	Grand Union Canal	A canal stretching 137 miles from London to Birmingham with arms into Slough, Aylesbury, Leicester and Northampton
	Headwater	Permanently flowing tributaries feeding a river system
HRA	Habitat Regulations Assessment	Assessment to consider the likely significant effects on designated European sites
INNS	Invasive Non-Native Species	Any non-native animal or plant with the ability to spread, causing damage to the environment and the way we live
	National Framework for Water Resources	An Environment Agency document that set the strategic direction for long-term regional water resource planning
	Natural England	The Government's adviser for the natural environment in England

Acronym	Term	Definition
	Natural Capital	Our stock of natural resources, including soils, air, water and all living organisms. Some natural capital assets provide “goods and services”, often called ecosystem services.
	Nature-based solutions	Sustainably managing natural features and processes to deliver wider benefits for customers – such as catchment management or river restoration
	Net zero operational carbon emissions	The water sector, through Water UK, has pledged to achieve net zero carbon emissions from its operations by 2030
	Non-household	Water use by businesses and public bodies such as schools and hospitals
NEUB	Non-Essential Use Ban	A drought order approved by the Secretary of State to restrict specific water uses by business
NIC	National Infrastructure Commission	An impartial, expert body commissioned by government to advise on infrastructure priorities and long-term challenges
Ofwat	Office of Water Services	The economic regulator of the water sector in England and Wales
	One in 500-year level of drought resilience	Being resilient to a drought that would happen on average once every 500 years – or it has a 0.2% chance of happening every year
PCC	Per capita consumption	The amount of water a person typically uses every day
	Planning horizon	How far ahead a plan looks
RAPID	Regulators' Alliance for Progressing Infrastructure Development	An organisation formed by Ofwat, the Environment Agency and Drinking Water Inspectorate to help accelerate the development of new water infrastructure and design future regulatory frameworks

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Acronym	Term	Definition
RBMP	River Basin Management Plans	Management tool within integrated water resources management containing descriptions of water resources within drainage basin and water allocation plans
	Regional Reconciliation	The process to understand how each region could support the others' developing regional plans
	Regional groups	The five regional groups outlined in the water resources framework – Water Resources South East, West Country Water Resources, Water Resources East, Water Resources North and Water Resources West
	River Restoration	The process of managing rivers to reinstate natural processes
SEA	Strategic Environmental Assessment	Assessment of the likely significant environmental effects of certain plans and programmes
STPR	Social Time Preference Rate	A method used to put a present value on costs and benefits that occur at a later date
SRO	Strategic Resource Option	Large-scale infrastructure solutions for securing the water
SESRO	South East Strategic Resource Option	A proposed reservoir in the Upper Thames catchment in Oxfordshire
SSSI	Sites of Special Scientific Interest	An area designation for conservation, usually due to particularly interest to science due to the flora or fauna within it or important geological features
	Supply-demand balance	The difference between total water available for use (as supply) and forecast distribution input (as water demand) at any given point in time over the Water Resource Management Plan's planning period / horizon

Acronym	Term	Definition
	Sustainability Reduction	Reductions in deployable output required to meet statutory and / or environmental requirements
	TOTEX	This combines the capital, operational and carbon costs associated with the options
TUB	Temporary Use Ban	Drought management measure imposed by water companies on customers – previously known as a hosepipe ban
WRPG	Water Resources Planning Guideline	Expectations set by Government about how water companies should develop their WRMPs published by the Environment Agency, Natural Resources Wales and Ofwat
	Water recycling	A process where wastewater is treated above usual standards to be returned to the environment and then abstracted downstream to process for drinking water
	Water UK	The trade association for water companies
WFD	Water Framework Directive	Environmental Legislation relating to river basin management and committing all EU member states to achieving good quality and good quantitative status of all water bodies and retained as UK law following Brexit
WINEP	Water Industry National Environment Programme	A programme issued to water companies by the EA which outlines what regulators expect companies to include in future investment plans to meet environmental obligations
WRMP	Water Resource Management Plan	A plan produced by each water company every five years that follows a statutory process and sets out how they will provide water over the long-term

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