

# Regional Water Resources Plan for Eastern England

DECEMBER 2023



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# About Water Resources East

Water Resources East (WRE) is the independent, not-for-profit membership organisation tasked by government to create a regional water resources plan for Eastern England that looks ahead to 2050 and beyond.

We are one of five regional groups covering England and parts of Wales, though our history pre-dates this. We were set up in 2014 as a collaboration between water companies and key representatives of other water-using sectors and environmental interests.

Our Board structure and governance is deliberately multi-sector due to the strategic importance of water to the regional economy, including agriculture and to the natural environment.

Figure i: WRE is one of five regional water resources planning groups covering England and parts of Wales



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**WRE has been given the important task by government of developing a long-term water resources plan for Eastern England. The entire region is designated as seriously water-stressed and the effects of climate change are already evident.**

**Extended dry periods, heatwaves and drought are what we can expect to happen more frequently in the future.** At the same time, economic, population and housing growth are creating added pressures, and more water will be needed for irrigating crops in the warming climate. The most urgent need is to reduce the amount of water abstracted and leave more water in the environment to help waterbodies and water-dependent habitats return to good health.

**This is WRE's first regional water resources plan, building upon the draft plan published for consultation in November 2022 and the emerging plan published in January 2022.** We have revised, updated and improved the plan following the detailed feedback we received earlier this year. We published a Consultation Response in July summarising this feedback and the steps we will take ahead of finalising our plan.

**For us, regional water resource planning is an inclusive, multi-sector, collaborative process, not simply 'engagement'.** This involves:

- Understanding the future needs and aspirations for water use for all sectors through to the 2050s and beyond, driven by environmental, economic and supply resilience ambitions and the need to mitigate the impacts of, and adapt to, climate change.
- Developing a portfolio of water efficiency and conservation measures alongside new supply options which will remain relevant in a range of future scenarios, factoring in uncertain projections of population and economic growth, climate change impacts, and the need to restore, protect and improve the natural environment.

- Pulling this together into a single regional plan that supports all water users and abstractors across the east to inform their own water management plans and strategies.

**Multi-sector, long-term water resources planning at this scale has not been done before in this country. Much progress has been made but also gaps identified that will need to be addressed in time for the next round of regional plans.** Foremost amongst these is the need for an appropriately funded approach to long-term planning for all water-using sectors, including the agri-food industry.

**Unlike the region's four water companies, agri-food and other abstractors do not have an established means to work together on long-term water resource planning. WRE's purpose, as an independent body, is to help all abstractors collaborate.** To enable this, funding needs to be provided to abstractor groups and to WRE (and indeed all the regional groups) to enable us to work together toward fully multi-sector, integrated water resource planning at the catchment and regional scales. A study has been commissioned by the Environment Agency to consider future funding options, reporting early in 2024. We see multi-sector planning as core to WRE's role and our regional plan is a significant milestone on that journey. Thanks to the feedback we received from our members and other stakeholders representing a wide range of sectors and other interested parties on previous versions of our plan and our flagship projects, this plan and other work we have in the pipeline will benefit and enhance sector-led activity and help equip all abstractors more effectively for the future.



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**We recognise that we are only at the very start of multi-sector water resources planning.** While our models have integrated agri-food, energy, carbon and local catchment specific metrics to inform the new resource options contained in this plan, we know that much more work needs to be done. We therefore welcomed the announcement from government and regulators in January 2023 that confirmed there will be a second round of regional planning following on immediately from this first round. Subject to final requirements due to be set in a second National Framework for Water Resources expected in spring 2025, the next iteration of our regional plan will be finalised in 2028.

**Our work with members and stakeholders will therefore continue with the aim of enhancing the evidence base required for long-term, cross-sector, adaptive water planning.** Working closely with abstractor groups and other local stakeholders, we intend to develop our understanding of how water resource pressures can be addressed at the local and catchment scales in ways that benefit all water users and the environment.

**With many thanks to my fellow WRE Board members, the WRE team and to all our members and stakeholders who have helped to get us this far.** We recognise there is much more to do but we have come a long way. If we get this right, it will help improve the management of water resulting in the restoration, protection and improvement of the environment, and facilitate environmentally sustainable agricultural, housing and economic growth in the eastern region for present and future generations.



**Dr Paul Leinster CBE**  
Independent Chair  
Water Resources East



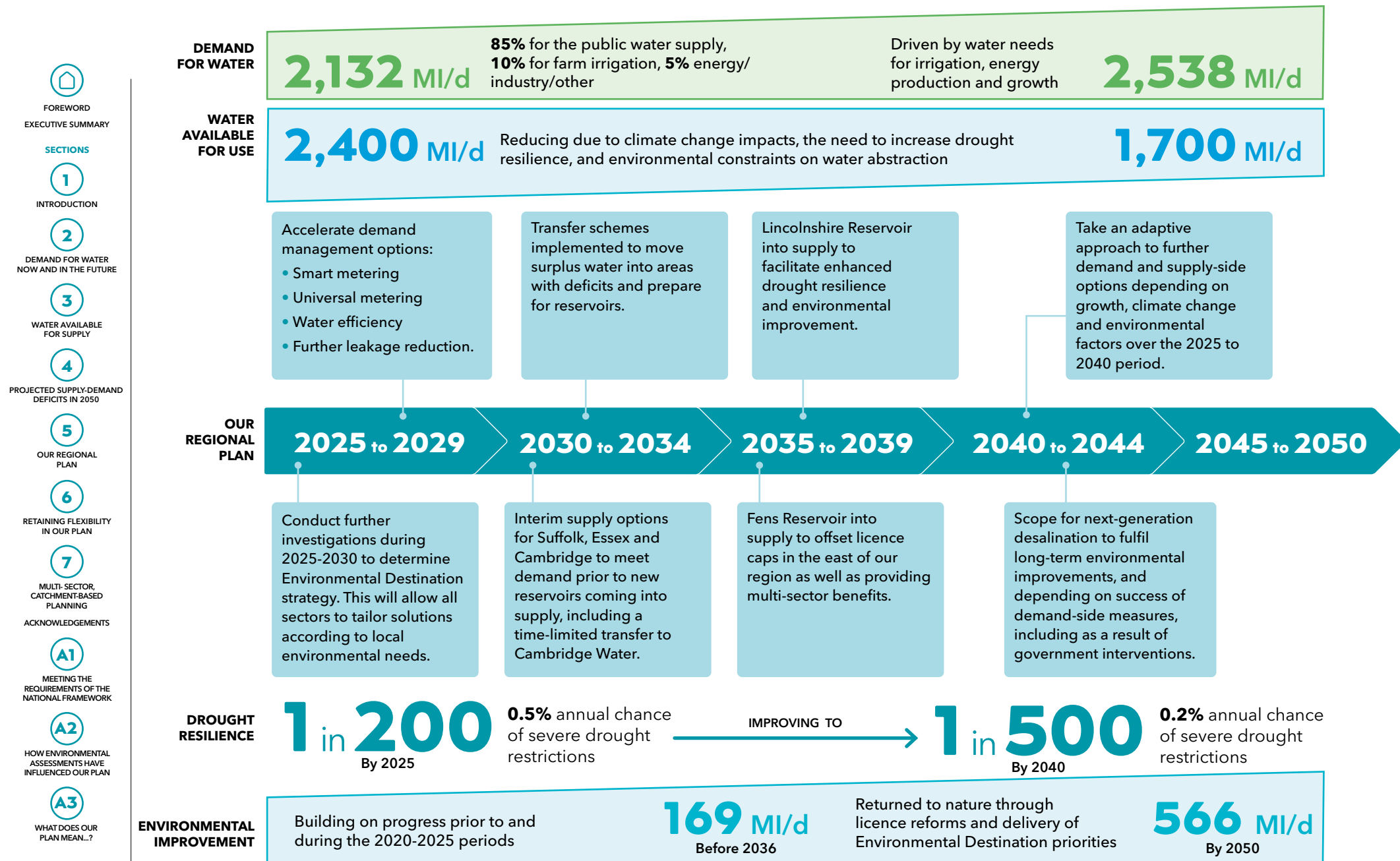


Figure ii: WRE's Regional Plan at a glance

All figures are in megalitres per day (MI/d). A megalitre is a million litres of water.

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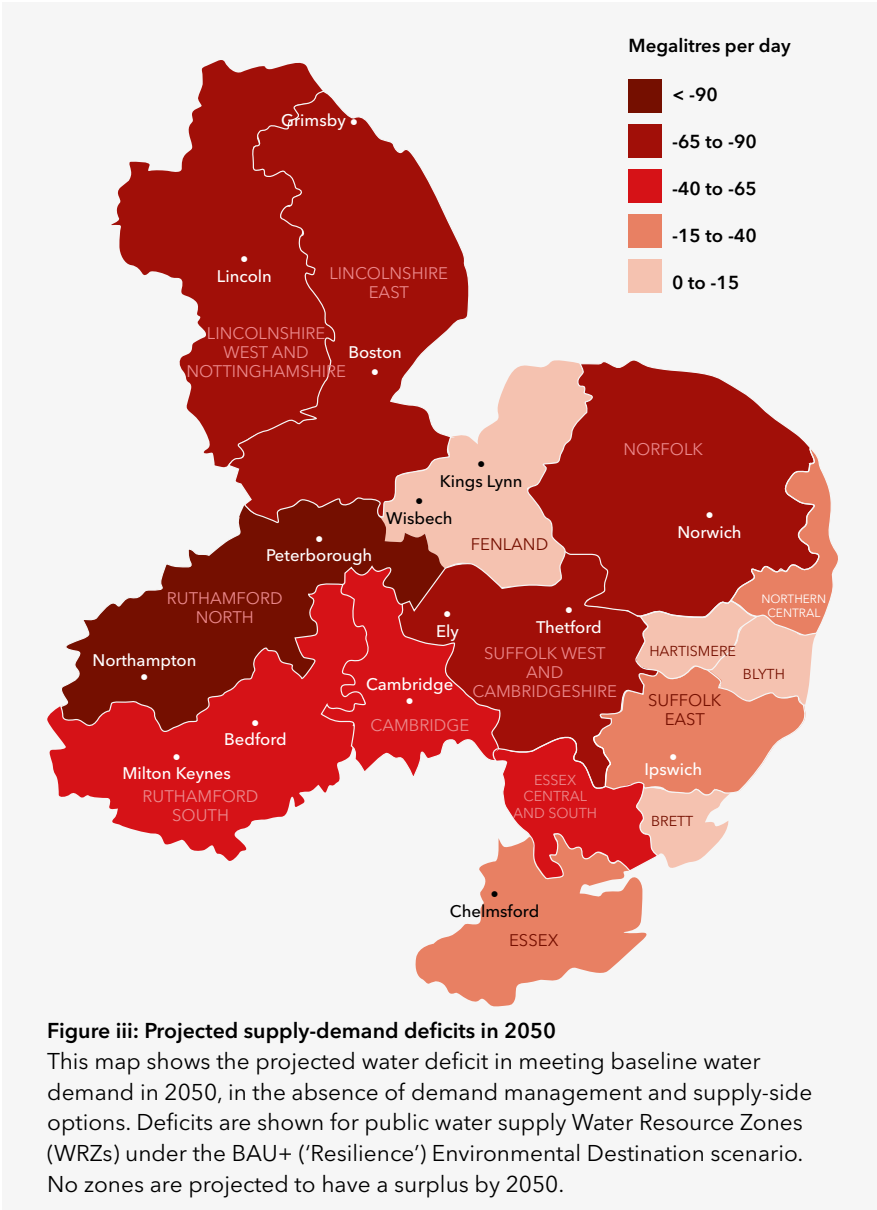
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There is an urgent need for all the major water-using sectors in Eastern England to invest in managing the present and future risks of water scarcity.

The whole of Eastern England is classified as ‘seriously water stressed’ by the Environment Agency. Yet the demand for water is growing with one of the highest rates of new housing development in the country. At the same time the region is experiencing less dependable weather patterns as a result of climate change, adding further pressure to the region’s scarce water resources and the natural environment. This is compounded by significant environmental pressures, in the form of abstraction licence reductions and ambitious Environmental Destination outcomes, to ensure the environment is protected for future generations.

Unless urgent action is taken by all sectors, the region will face severe water shortages. This will constrain agricultural production and curtail economic growth, impacting the region’s prosperity and endangering the east’s iconic chalk rivers, peatlands and wetlands. Farmers and land managers, businesses, the power sector and water companies need to start planning for and investing in significant new sources of supply. All of us as individuals and across sectors will need to use water more efficiently.

Water companies will continue their drive to reduce leakage from their own networks and invest in smart metering and other demand management technologies. However, past investment in demand management and leakage control within the region means that there is less potential here than elsewhere in the country. Only with significant new investment in supply-side options can the projected shortages of water be met.



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- Public water supply:** is projected to have the largest sectoral supply-demand deficit in 2050 of 730 Ml/d (40% of baseline supply in 2025), largely driven by the volume of water currently abstracted that will need to be left in the environment in the future. Water companies have the expertise, ability to collaborate with each other, and access to funding through customers' bills to bridge this gap. The scale of change nonetheless represents a generational challenge and could put significant cost pressure on water bills for decades to come. There is likely to also be further and significant demand for new non-household water consumption, which may not yet be factored into our core projections. This means that even if water company investment plans are fully funded, the availability of water to support regional ambitions for economic growth could be severely limited. We consider it part of our role to bring stakeholders together to better understand growth demands at the national, regional and local levels and explore and develop solutions to meet these needs.
- Farmers, growers and land managers:** have an equally significant challenge due to the lack of certainty over the volumes of water they currently abstract that, in future, will need to be left in the environment to safeguard nature. Our plan suggests the agriculture sector in Eastern England will lose access to up to 59 Ml/d of water projected to be needed from ground and surface water sources (approximately 17% of current estimated peak summer abstraction for spray irrigation). Individual farmers have only 28 days to appeal against formal notice of licensed volumes being cut back, and insufficient time in many cases to secure alternative water resources to safeguard future years' crops. Greater forewarning is needed to give farm businesses enough time to plan and invest. All farm abstractors need to look at how they can adapt their operations in light of reduced water availability in the future, even if the exact change in volumes are not yet known.
- Energy and power:** the sector's abstraction of freshwater is likely to reduce over the coming decade as fossil fuel generation continues to make way for renewables and new nuclear. However, hydrogen production and carbon capture, usage and storage (CCUS) are both water-intensive processes. The scale and location of these new facilities are largely unknown at present but could have significant implications for freshwater demand. Commercial sensitivities over the location of future investment in net zero energy facilities limits our ability to forecast the sector's water needs with confidence.

## What are water companies already doing?

**Whilst our plan focuses on the 2025 to 2050 period, water companies have been planning for growth, environmental improvement and climate change impacts for decades. Investment in water resources management increased significantly for the 2020-2025 period as a result of Water Resources Management Plans prepared to inform the 2019 Price Review (PR19).**

For example, Anglian Water's investment in delivering their latest water resources management plan in the period 2020-2025 is £900 million, eight times higher than in the investment period 2015-2020. This means by 2025, water companies operating in Eastern England will have:

- Progressed with smart metering programmes for both household and non-household customers. By 2025, around half of Anglian Water's customers will have a smart meter. These take hourly meter readings available via an app to help households reduce consumption and water companies to highlight leakage within properties and their supply networks.
- Limited abstractions in accordance with Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 requirements, protecting the environment from 85 Ml/d of potential future abstraction.
- Reduced leakage by an average of 16%. Companies in Eastern England are already amongst the best performing for leakage control, with plans to improve this further as part of a national commitment to halve leakage by 2050.
- Built a 300km-long 'Strategic Interconnector' pipeline that allows water to be transferred at scale from the wetter north of the region to the drier south, providing a backbone for new resource options to be connected to, and additional local transfers between water resources zones and company regions.

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PLAN MEAN...?**This regional plan identifies the ‘best value’ approach to meeting the projected supply-demand deficits for the public water supply in a way that maximises co-benefits for other water-using sectors.**

- For the public water supply, our plan focuses first on demand management including leakage control, and this has been significantly strengthened since the draft plan stage. The set of demand-side measures are now expected to meet almost half of the identified public water supply deficit in 2050 (332 MI/d of the projected 730 MI/d deficit, up from 160 MI/d in the draft plan). Our member water companies now plan to reduce leakage by 39% versus the 2017/18 baseline by 2050 (up from 29% at the draft plan stage). Household demand is forecast to reduce from 135 litres per person per day (l/p/d) in 2025 to 110 l/p/d in 2050, to meet the national target. However, significant projected iregional economic growth will make achieving a full contribution toward the 9% national target reduction in non-household consumption by 2038 very difficult. Our plan is based on achieving a 9% reduction in non-household consumption relative to growth instead. Whilst this represents a 3% increase in consumption against the baseline, we do not wish to unnecessarily curtail sustainable economic growth if we can also achieve environmental improvement at the same time. This is a good example of why national targets - for leakage as well as non-household consumption - should not simply be applied at a regional and water resource zone level. There are specific regional differences in projected growth and prior water company performance that need to be taken into account. However, our core plan involves a 19% reduction in overall water consumption per capita by 2038, closely mirroring the statutory national water saving target of a 20% reduction.
- Our modelling has identified the following supply-side options as part of our core, best value plan to 2050: two major new reservoirs located in south Lincolnshire and the Cambridgeshire Fens, a further reservoir in North Suffolk, effluent reuse and other smaller projects, and in the longer-term, several desalination plants. Both strategic reservoir projects secured regulatory approval in June 2023 to proceed to the next stage of their development. Further public consultation will take place on both projects in spring 2024. The more ambitious demand-side strategy we are now proposing means that fewer desalination plants feature within our core pathway to 2050.
- These options need to be supported by a number of smaller schemes as well as a significant increase in water being transferred between water resource zones and company areas within the WRE region. Due to the shortage of water in Eastern England, our plan involves no new transfers of water out of the WRE region to other parts of the country. A previous proposal to transfer some water from the Lincolnshire Reservoir to the Water Resources South East region has been discounted in favour of Affinity Water being supplied from Water Resources West instead.
- However, detailed work with the other regional groups since the draft plan stage has highlighted a new temporary inter-regional scheme benefitting Cambridge Water. This involves the early delivery of the full Grand Union Canal transfer scheme between Water Resources West and Water Resources South East, offsetting the need for Anglian Water’s existing transfer to Affinity Water. The water released from this ‘reverse trade’ between Anglian and Affinity would instead be transferred to Cambridge Water to help meet their deficit in the period before the Fens Reservoir comes into supply.
- If demand management fails to achieve the projected savings in water consumption, the impacts of climate change increase, if population and economic growth accelerates, and/or more ambitious environmental returns are required, then more desalination capacity and water reuse would need to be brought forward due to the lack of other new supply options in the region. Our plan is heavily reliant on government policy achieving significant savings in water consumption, in particular through the introduction of a mandatory water labelling scheme for bathroom fittings and appliances in 2025. A decision will be needed in around 2027 on whether to bring forward the first desalination plant on the east coast if water demand is tracking toward a high consumption pathway.

**Through our work on producing the regional plan, it is clear that regulators, local authorities, environmental groups and customers place greater priority on water companies reducing demand for water before investing in new supply-side options.** This is only right and this plan reflects this approach. However, with this comes the responsibility for everyone in their homes, at leisure and in their working lives to do what they can to reduce water consumption. Page 27 has further details.



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Figure iv: Supply-side options in the best value plan to 2050

**Legend:**

- Affinity Water
- Anglian Water
- Cambridge Water
- Essex & Suffolk Water
- Small water company resource option
- Raw water storage reservoir
- Desalination
- Water reuse
- Water treatment works upgrade
- New transfer
- New time limited transfer
- New strategic pipeline (to be built by 2025)

**Map Labels:**

- Grimsby
- Lincoln
- Boston
- Lincolnshire East
- Lincolnshire West and Nottinghamshire
- Fens reservoir
- Peterborough
- Wisbech
- Kings Lynn
- Thetford
- Norfolk
- Norwich
- Bacton desalination
- Caister-on-Sea reuse
- Lowestoft reuse
- North Suffolk reservoir
- Hartismere
- Blyth
- Suffolk West and Cambridgeshire
- Suffolk East
- Ipswich
- Colchester reuse
- Holland-on-Sea desalination
- Brett
- Chelmsford
- Essex
- Linford water treatment works upgrade
- Cambridge
- Ely
- Ruthamford North
- Northampton
- Ruthamford South
- Bedford
- Milton Keynes

Public water supply only under the 'Resilience' (BAU+) Environmental Destination scenario

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**Work at a more detailed catchment scale has begun to identify local needs for farmers and other businesses, but is being hampered by a lack of available funding for these kinds of studies.** However, there has been significant progress since our draft plan was published in line with the recommendations we made at that stage:

- The Water for Food Group has secured funding from Defra to commission new guidance and templates to support water resources and drought management plans being produced within the agricultural sector. The Water for Food Group consists of stakeholders and decision makers from the agricultural and horticultural sectors working closely with government and regulators.
- Cranfield University has been commissioned using funding from the Environment Agency, Defra and the NFU to assess the impacts of drought and abstraction reform on irrigated agriculture.
- Ministers made commitments at the [UK Farm to Fork Summit](#) in May to fund abstractor groups and other local stakeholders to identify new local water resource options that could benefit agriculture and other local users. Regional groups should be funded to support this work.
- The Environment Agency has commissioned Arup to consider how to fund multi-sector water resources planning for the longer-term with the conclusions expected early in 2024.

**From our work supporting abstractor groups in the Ant Valley in Norfolk and elsewhere, agri-food business supply deficits will likely need to be met through a combination of water efficiency and rainwater harvesting, bilateral agreements with water companies for access to the public water supply and treated effluent for non-potable water uses, and investment, individually or in partnership with other landowners, in new on-farm winter storage reservoirs.**

Such projects can take years to deliver, including to secure planning approval, reinforcing the need for farmers to be given sufficient information and prior warning of licence changes by the Environment Agency in order to adapt their operations. Abstractor groups, where they exist, allow planning work to be undertaken at a local level directly with farm and other businesses. All of this requires support from multiple agencies and across government departments to be successful.

**Internal drainage boards (IDBs) will also be key where they exist, but they currently lack the powers and functions to be able to maximise their role in integrated water and environmental management.** IDBs are statutory bodies serving low-lying areas across Eastern England, with objectives focusing on flood risk and water level management, and conserving biodiversity. They are able to move water around their districts during the year to support the water resource needs of agriculture, navigation and the environment. However, their mandate and funding for this is limited. The role of IDBs should be formally extended to add carbon and water resources management to their existing powers and duties. This recommendation in our draft plan was strongly reinforced by the [Lowland Agricultural Peat Task Force's report to government](#) published in June 2023.



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## How we have responded to feedback on our draft Regional Plan

The feedback we received on our draft plan including from regulators has led to a number of improvements being made. These are summarised in the table below.

Feedback	Changes made in finalising our regional plan
<b>Environmental Destination:</b> Bring forward environmental improvements as soon as possible, prioritised to achieve early benefits for sensitive waterbodies such as chalk streams and water-dependent habitats.	Our final plan shows the timing of early environmental improvements that will result from abstraction reforms underway, and how longer-term benefits are being prioritised toward sensitive environments. We also set out our plans to commission detailed environmental investigations to inform the next round of regional planning.
<b>Supply options:</b> Bring forward additional, cost-effective supply-side options to help meet the forecast deficits and to bring forward the timetable for environmental improvements.	Further work has been conducted but existing pressure to reduce freshwater abstraction severely limits the range of new supply options available in the east of England. We have also re-examined the potential for new inter-regional transfers in the short and longer term, but in general costs are high, benefits uncertain, and other regions face their own pressures. However, a new interim, medium-term option to supply Cambridge Water indirectly from Water Resources West has been identified, involving a 'reverse trade' of the existing Anglian Water to Affinity Water transfer.
<b>Demand management:</b> Present more ambitious leakage, household and non-household savings in line with national targets set under the Environment Act 2021, and show what steps would be taken if savings do not materialise.	Our final plan includes more ambitious plans for leakage control and demand management. This includes programmes to reduce consumption amongst non-household customers, although demand for new non-household connections (e.g. to produce green hydrogen) may counteract these savings. We have tested different scenarios for actual demand-side savings, and more fully explored the reliance on forthcoming government policies that aim to reduce water consumption.
<b>Best value planning:</b> Provide additional evidence and documentation to show that the plan represents best value for all sectors and the environment.	We have produced additional technical documentation to underpin this final plan, including to describe how the results of a wider range of scenarios and sensitivity tests affect the key decisions and proposals in the core plan.
<b>Supporting non-public water supply sectors:</b> Present options that resolve the projected deficits for agriculture and other sectors. Maximise the potential for multi-sector and public value benefits from the two major new reservoirs being proposed.	As the draft plan explained, WRE is not funded to support options development and water resources planning for the non-public water supply sectors. Discussions are underway with government and regulators on how this funding gap can be resolved for the second round of regional planning, including to make sure the detailed environmental investigations being commissioned will support enhanced planning by all sectors.

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**The regional planning process initiated by the first National Framework for Water Resources in 2020 has created a much more comprehensive, strategic planning approach to meeting the nation's future water needs.** But there is more to do to make sure the risks of water shortages for all sectors are being properly planned for and managed. In our draft plan, we called on government and regulators to:

- **Commit now to a second round of regional planning so that the five regional groups do not lose momentum.** Otherwise, key skills and knowledge, and multi-sector support and ambition, will be lost as staff inevitably move on. We were therefore pleased to receive a [letter in January 2023](#) confirming a second round, with an updated National Framework for Water Resources expected in spring 2025.
- **Accelerate the timetable for new government policy on demand management, including tighter building regulations for water efficient new homes and the proposed mandatory water efficiency label on white goods, taps, toilets and showers.** Government has since reinforced its policy commitment to help reduce water consumption in the updated [Environmental Improvement Plan](#) published in January 2023 and the subsequent [Plan for Water](#) in April. The former included a new roadmap for increasing water efficiency in new developments and retrofits, to be delivered over the next decade. The government recently confirmed that it will introduce a [mandatory water efficiency label](#) on relevant appliances and fittings in 2025.
- **Fund the regional groups so that they can fulfil their remit on a multi-sector basis from mid-2023.** At present, WRE's Technical Programme is entirely funded by our water company members, who are prevented from using customer income to pay for studies that benefit other sectors. In line with this recommendation, the Environment Agency has commissioned a study by Arup to explore funding options that is due to report in early 2024. As these options are likely to need to go through consultation and possibly legislative processes, the Environment Agency has asked each regional group for details of their short-term funding needs.
- **Create more long-term certainty for all abstractors over the impact of forthcoming licence reforms.** The Catchment Based Approach (CaBA) national working group on Abstraction and Water Resources could extend its remit with WRE to navigate through licence reduction challenges and escalate strategic issues to decision makers, including, where appropriate, to ministers. The Environment Agency has now provided early warning to licence holders who may be impacted by the review of time limited licences in 2024 and the review of permanent licences across the Broads Special Area of Conservation necessary

under the Habitats Directive. However, the scale of potential licence cuts is uncertain at this stage. Further licence restrictions may be needed for permanent licences from January 2028, and as and when catchment-specific Common End Dates for time-limited licences approach.

- **Establish a single, integrated approach to planning for environmental improvement for all sectors, that clarifies through joint investigations the necessary returns of water to the environment in the short, medium and long-term.** This should consider water quality aspects alongside quantity requirements so that a joined-up, efficient and effective approach is achieved. We have been working with our member water companies to develop an approach to this closely supported by the Environment Agency who held a series of workshops in the autumn. However funding for the non-public water supply elements of these investigations needs to be secured urgently, as studies are due to begin in earnest in April 2024. WRE is in discussion with government and regulators about this.

**The approach to planning for new non-household growth also needs to be improved, through closer working between government, regulators, regional groups, water companies and planning authorities on this issue.** Non-household use of the public water supply fell in 2020 due to Covid-19 lockdowns but recovered quickly and has since accelerated in the region. Much of this new demand was not forecast and therefore not factored into the last round of water resources management planning in 2019. As a result, water companies in the region are now having to refuse a significant proportion of new requests for water supplies, stalling commercial, industrial and infrastructure investments. Improving the evidence base on non-household water consumption and growth is an early priority action we have identified in our refreshed Business Plan for 2024 - 2028. The government needs to factor water needs and potential multi-sector opportunities into its Net Zero Strategy, for example to support green hydrogen production. Planning authorities need to scrutinise developers' and their own plans for growth and regeneration from a water resources perspective and work with water companies to bring forward the required infrastructure. Ofwat should have a stronger legal duty to support sustainable growth to encourage water company investment in this area. The government should also review whether it is sensible to expect all water companies to achieve the full 9% reduction in non-household water consumption by 2038 if this would constrain growth and prosperity in some regions.

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## WRE's preferred environmental outcome

**Taking a long-term view in our regional plan at the draft and this final stage has allowed us to explore the actions and investments that would be needed between now and 2050 to meet the outcomes sought by the Environment Agency's most ambitious environmental enhancement scenario.**

### This 'Enhance' scenario entails:

- Supporting the achievement of 'Good Ecological Status' (or 'Good Ecological Potential') in all waterbodies, even where the Environment Agency has previously considered it 'uneconomic' to do so.
- Providing extra protection for European Protected Sites and Sites of Special Scientific Interest (SSSIs).
- Delivering enhanced protection for chalk streams, wetlands and sensitive headwaters.

The goals of the 'Enhance' scenario therefore represent WRE's preferred environmental outcome. However, it is too early in the evolution of the regional planning process to know definitively if the full extent of returns to the environment currently suggested under the 'Enhance' scenario will be necessary in practice to achieve these goals. Further investigation is required, and plans are now in place to begin this process in earnest in 2024. Subject to funding being provided, such investigations should be conducted on a multi-sector basis. We have requested the required funding from government.

While there is still uncertainty in the magnitude of potential water abstraction reductions needed over the long term, we have identified a set of actions and investments needed in the next ten to 15 years that are largely the same regardless of the eventual Environmental Destination. Making progress on these now will be critical to delivering greater drought resilience and keeping the 'Enhance' scenario outcomes in play.

Therefore at this stage, in part to ensure alignment with company-level Water Resource Management Plans and the other regional groups' proposals, our core pathway to 2050 presented in this plan is based on the 'Resilience' scenario (referred to as 'Business as Usual Plus' or BAU+ by regulators).

Investigations between now and 2030 will define the specific needs of the region's most sensitive water-dependent environments such as chalk rivers, wetlands and headwaters. We can also understand better how nature-based solutions can support these specific needs in the highest priority locations.

These investigations will inform the scale and location of further strategic and more localised schemes that will be required from the mid-2030s to deliver the required environmental returns. An 'Enhance' scenario will very likely include further water reuse schemes, and more or bigger desalination plants in Essex, Norfolk, Suffolk and Lincolnshire. Continuing work to plan for these additional schemes at a range of potential scales between now and 2030 means that water companies will have made sufficient progress by then to take them forward in earnest as part of future planning rounds should they be needed.

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## Links to related water resources plans and reports

Alongside our plan, a number of other supporting and related documents are available online:

- A series of reports and annexes underpinning this final regional plan.
- Revised draft water resource management plans (WRMPs) published by the four water companies supplying customers within the WRE region:
  - [Anglian Water](#)
  - [Essex & Suffolk Water](#) (part of Northumbrian Water Group)
  - [Cambridge Water](#) (part of South Staffordshire Water)
  - [Affinity Water](#).
- RAPID's [final decisions on Gate 2 submissions](#) for the strategic resource options in our plan:
  - for the Lincolnshire Reservoir
  - for the Fens Reservoir; and
  - the Anglian Water to Affinity Water Transfer (A2AT).

If you have any comments or queries regarding our plan please get in touch with us by emailing [contact@wre.org.uk](mailto:contact@wre.org.uk).





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# 1 INTRODUCTION



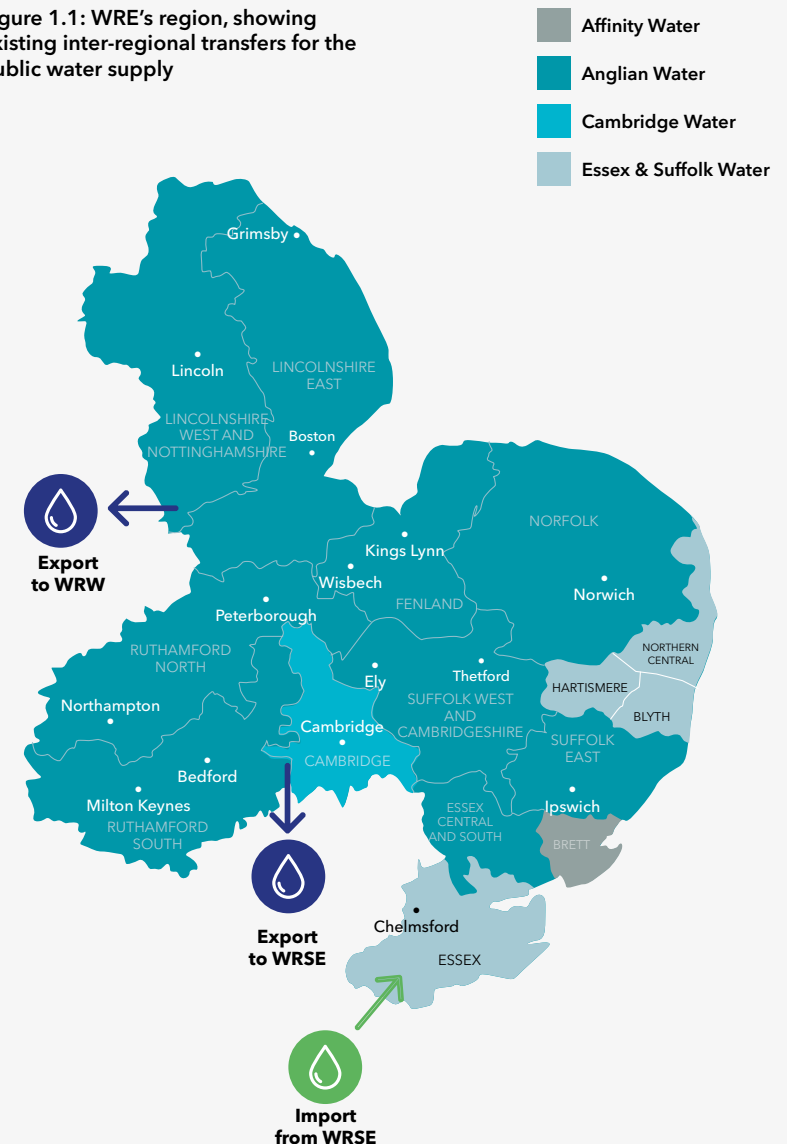
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**Eastern England is the driest region of the UK, receiving only two-thirds of average national rainfall. Many of the region's chalk rivers, peatlands, wetlands and sensitive water environments are in poor health due to decades of licensed over-abstraction alongside other pressures. Housing growth and the region's agricultural production is at risk of being curtailed as access to existing water resources is reduced and the impacts of climate change are increasingly felt.**

There is a real risk that without additional action by all sectors, a lack of water will constrain both the regional economy and nature's recovery. More rainfall needs to be captured and stored, and water needs to be better conserved and reused.

- WRE's region is already classified by the Environment Agency as severely water stressed. Demand for water is growing with one of the highest rates of new housing development in the country.
- Climate change will make existing seasonal patterns of rainfall less dependable, with longer and more extreme periods of drier weather and drought increasingly likely.
- The east has the majority of England's best and most fertile land, growing high value but also highly water-dependent crops. Hotter, drier spring and summer growing seasons mean more water will be needed to irrigate crops in the warming climate.
- The Broads National Park, the Wash and Fens are internationally recognised within a region that is home to more than a quarter of Britain's rarest wildlife. A globally-significant number of chalk rivers and the UK's largest extent of lowland peat also mean that the health of the predominantly freshwater ecology and nature in the east is dependent upon the availability of water in river systems, aquifers and the environment.
- Eastern England also has many miles of navigable waterways and the largest lowland drainage network in the country. Both are integral to current and future water management approaches with IDBs playing an increasingly important role.

**Figure 1.1: WRE's region, showing existing inter-regional transfers for the public water supply**



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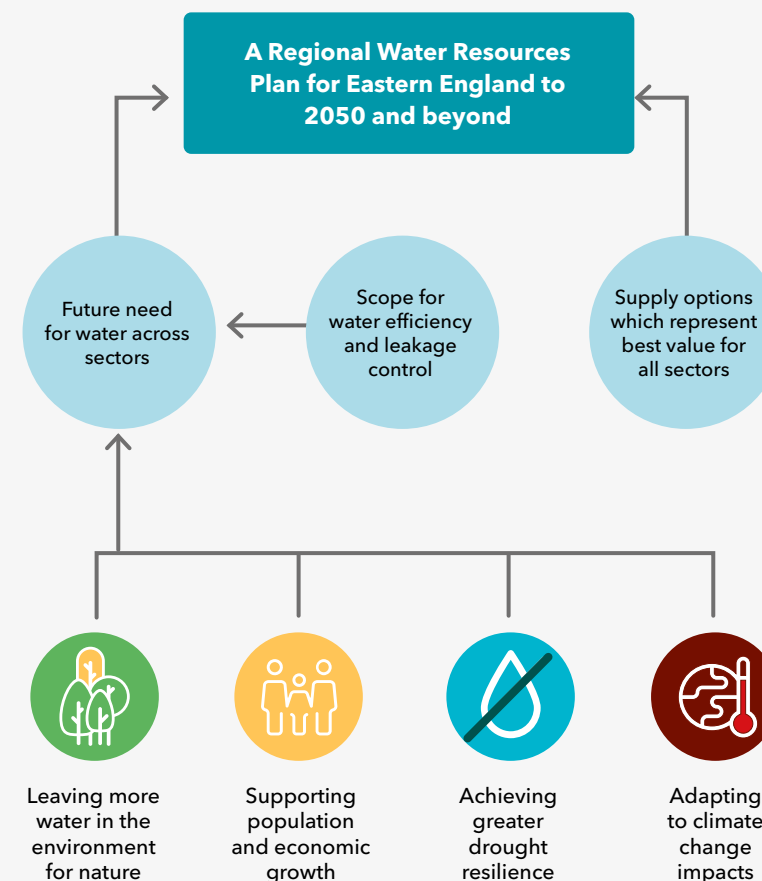
**Water Resources East's role is to prepare a single, integrated regional plan that ensures there are resilient water resources available to meet the needs of the environment, the growing population and the regional economy through to 2050 and beyond, taking full account of climate change.** The requirements for our plan were set by the first [National Framework for Water Resources](#) published in 2020; a collaboration between government, regulators, the water industry and other key sector representatives.

- WRE is different to the other four regional groups because of our independent, not-for-profit status, with cross-sector representation on our Board, Strategic Advisory Group, Technical Delivery Group and Task and Finish Groups.
- As well as showing how projected shortfalls in the public water supply should be bridged as part of a 'best value' (rather than least cost) plan, we have also explored the water needs and pressures faced by the farming, business and power sectors. We are working on a wide variety of projects and other initiatives to help understand and inform how these needs and pressures can be met.

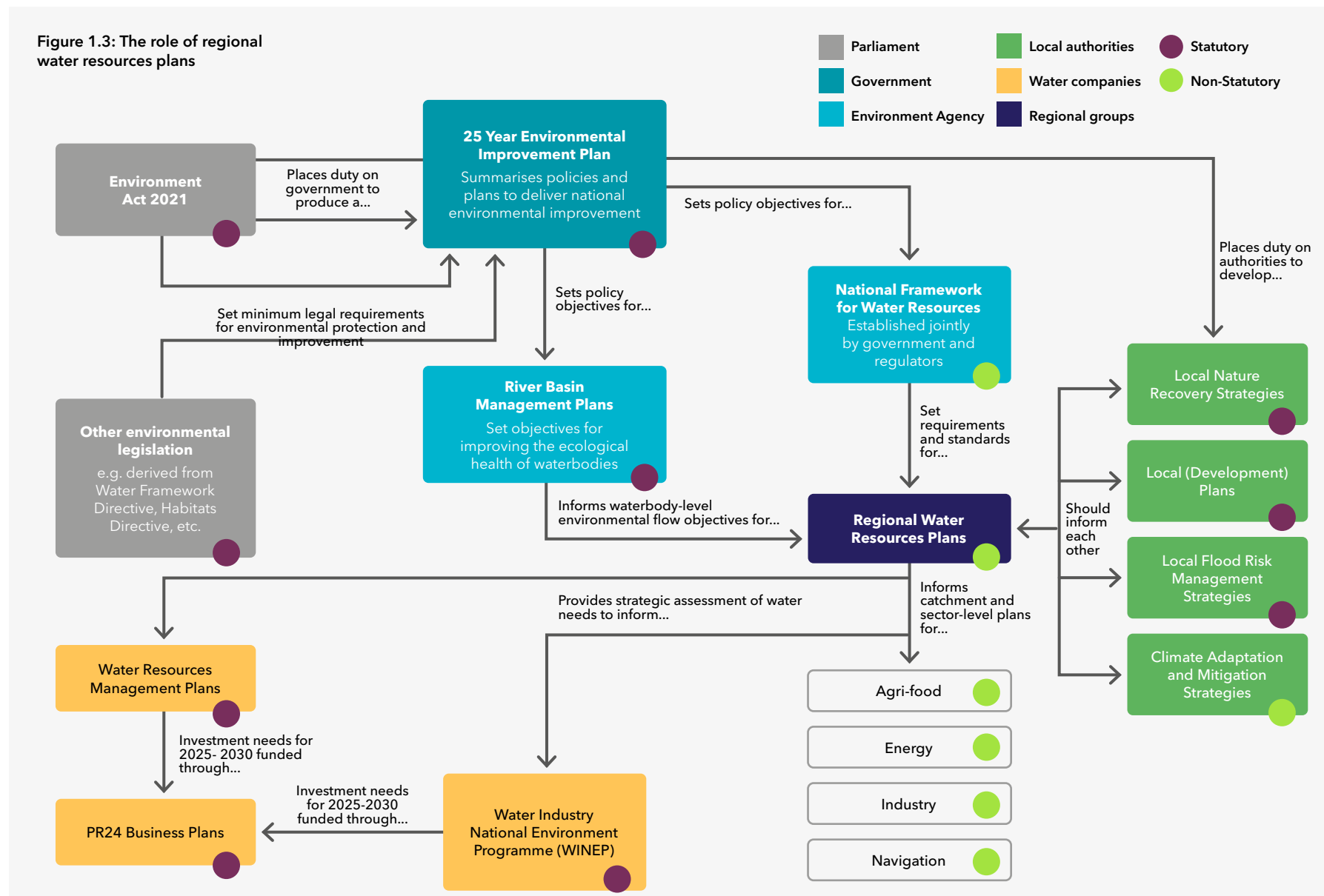
**The extended dry spell and drought in 2022 highlighted the lack of resilience within the water resources available to agriculture in particular. When dry conditions hit, it is often the environment that suffers first as water levels dwindle.** Past investment by water companies in the region meant they had sufficient public water supply resilience to meet heightened levels of demand over the extended dry period without having to impose Temporary Use Bans (TUBs, or 'hosepipe bans' as they are commonly known). The use of TUBs is an important tool to encourage reduction of unnecessary domestic water usage during times of high water demand. It is important that all sectors and the general public continue to better understand their water use and do more to manage the region's scarce water resources. For this reason, WRE established a multi-sector Drought Group in early 2023 and now attends National Drought Group meetings chaired by ministers and senior officials. WRE's Drought Group seeks to support cross sector conversations and activities in relation to drought and explore potential short-term water sharing opportunities.

Temporary Use Bans (TUBs) and Non-Essential Usage Bans (NEUBs) are a formal part of the Drought Plans developed by each water company. TUBs impose restrictions on the use of hosepipes, jet washers and sprinklers as well as domestic swimming pools and jacuzzis to help manage demand and protect the environment during drought conditions. NEUBs impose similar restrictions on non-household users of the public water supply.

Figure 1.2: How we have built our Regional Plan



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**Demand for water within Eastern England is increasing, driven by economic and population growth and the changing climate. Overall, water demand for all sectors is projected to be 2,132 MI/d in 2025, rising by approximately 19% to 2,538 MI/d by 2050, despite water company demand management strategies already in train.**

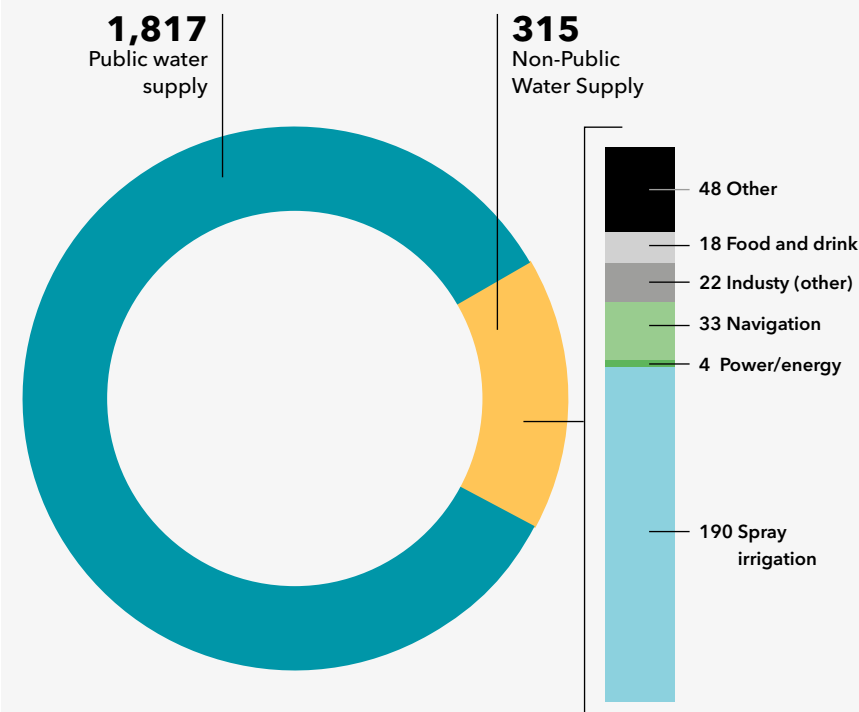
Some demand projections for sectors are more certain than others, with projections of water use for energy including green hydrogen the most uncertain at this stage. Demand for new non-household consumption from the public water supply has also increased much more rapidly than anticipated in the 2019 round of Water Resource Management Plans.

- Agriculture:** The east is the key crop-growing region of England and is heavily reliant on water for irrigation to grow salad crops, vegetables, potatoes and soft fruits. A significant increase in demand for spray and drip irrigation is anticipated over the coming years during the warmer, drier and extended growing seasons expected in future. Projections are uncertain, but at the upper end, water needs for irrigation could more than double by 2050 (from 190 MI/d today to between 264 and 479 MI/d by 2050). While agriculture uses only around 10% of the regional total on average, in certain catchments and at certain times of the year agricultural demand is much more significant. More than two thirds of abstraction for irrigation typically occurs between June and August, with the peak month of July accounting for more than a quarter of the sector's total annual abstraction. On average, peak summer abstraction for irrigation is around 350 MI/d, and this can almost double in a dry year to around 600 MI/d when crops are in need.



**An average sized bath tub, half full, equates to 100 litres of water. A cubic metre is one thousand litres and a megalitre (MI) is one million litres.**

Figure 2.1: Baseline projection for water use in 2025



**2,132**  
Million litres

**Average daily water consumption in our region**

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- Energy and power generation:** Power stations across the region are major users of freshwater, particularly in the River Trent and Great Ouse catchments. Nationally, the amount of freshwater needed for power generation is due to continue to fall during the mid-2020s as the remaining coal-fired power stations close and gas-fired generation falls in favour of renewables. Water use could increase in the longer-term depending on how much freshwater is needed for hydrogen production, and if carbon capture, usage and storage (CCUS) technology is deployed at power and industrial plants as part of the UK's net zero strategy. But the amount of freshwater needed in future is highly uncertain as it is not clear at this stage how much of this capacity will be installed in Eastern England. We are working with Energy UK, Net Zero East and others to better understand the energy sector's needs across the region.
- Public Water Supply:** The public water supply accounts for 85% of regional water demand at present. This is dominated by Anglian Water, supplying 65% of the region's population (Figure 2.2). Water companies are already pursuing the demand management and leakage strategies set out in their 2019 Water Resources Management Plans (WRMPs). Taking these existing plans into account, water use by households (HH) and non-household (NHH) customers is projected to grow from 1,817 Ml/d in 2025 to 1,990 Ml/d by 2050. There are also strategic growth areas in our region, most notably Greater Cambridge and the Oxford to Cambridge strategic corridor, where projections of growth and future water use are uncertain. To capture and plan for this we have liaised closely with our water company members to model a range of growth scenarios. We are also working with the Cambridge Delivery Group to consider even more ambitious growth plans in line with the government's [long-term plan for housing](#) (on page 26). However, demand for new non-household consumption has increased since 2020 much more rapidly than projected in the 2019 round of WRMPs, leading to a large proportion of requests for new NHH supplies having to be declined last year and this year (see Box on page 25). The core growth projections underpinning this plan may similarly underplay the potential for increasing NHH demand. Local development plans do not always consider future water use in detail and the nature of development can change toward more water-intensive types as proposals mature.
- Industry and other direct abstractors:** Water use by other abstractors including for food and drink manufacturing is 88 Ml/d. Evidence to support demand projections for these sectors is limited. Future water demand for other sectors including food and drink and paper and pulp manufacturing is informed by work done as part of the Water Resources National Framework.

- Navigation:** The navigable network of canals and rivers in the region stretches to more than 600 miles, with river levels and channels maintained by a combination of the Canal & River Trust, the Environment Agency and individual IDBs. The Canal & River Trust alone currently abstracts 33 Ml/day to support navigation. Work is being carried out by the Canal & River Trust to better understand how future water needs may be affected by climate change and environmental requirements. New stretches of navigable waterway are also being championed, such as the Boston to Peterborough Wetland Corridor, Stamford River Canal, and the Bedford to Milton Keynes Waterway.

**In addition, there are a number of anticipated but as yet unquantified needs for more water, for example to restore areas of lowland peat to avoid continuing carbon dioxide emissions (see Box on page 28).** Preventing oxidisation of peaty soils requires water tables to be raised to within 5-10cm of the surface. Healthy peatland soils consist of 90% water.

Figure 2.2: WRE regional population split by water company, 2025-2050

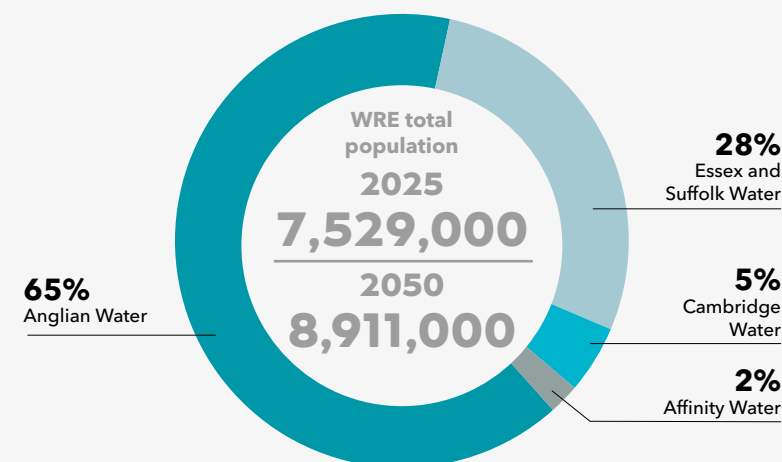
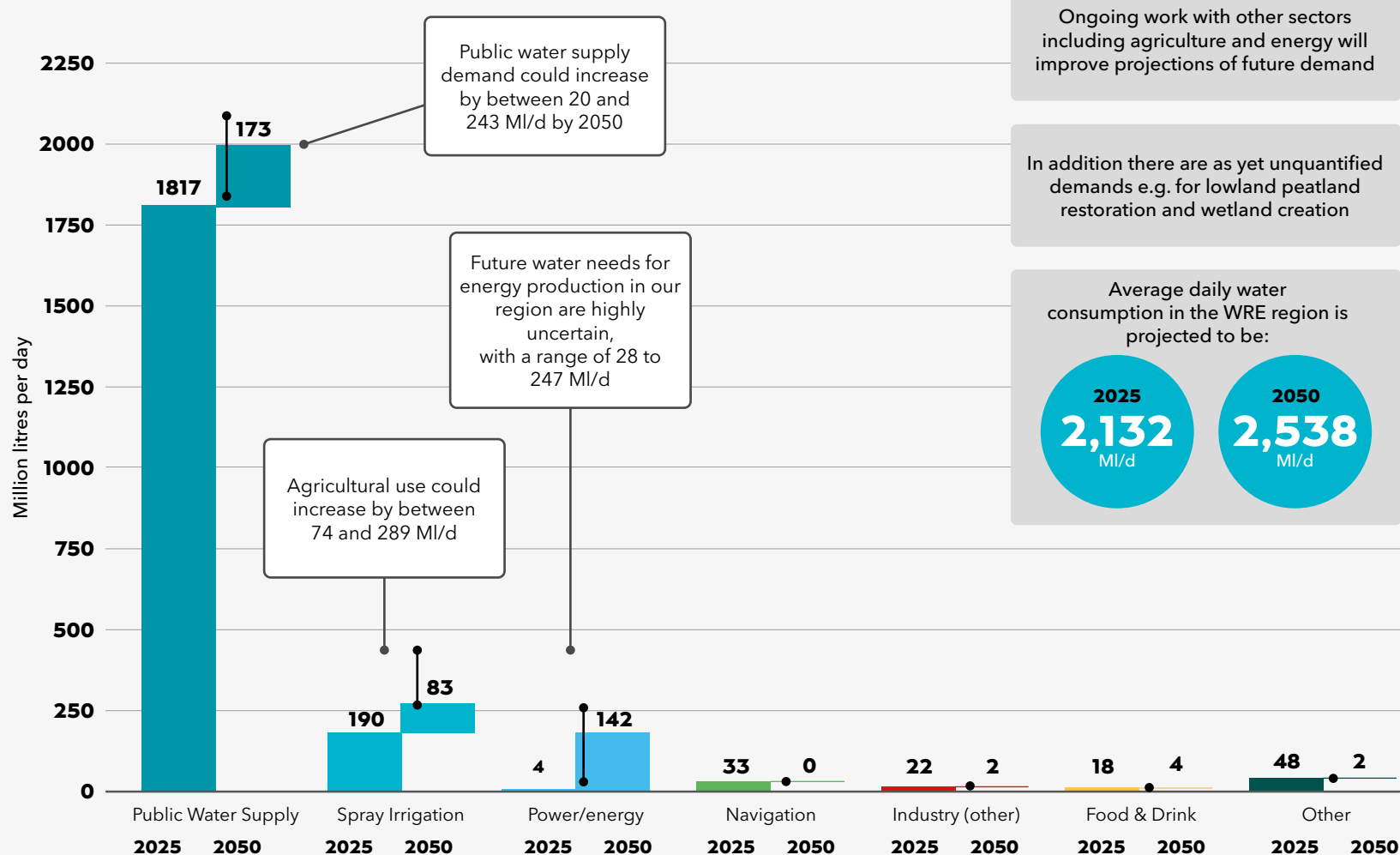


Figure 2.3: Projected water use by sector in 2025 and 2050



Note: Public Water Supply demand based on baseline Dry Year Annual Average (DYAA) data without demand management options



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### The challenge of planning for non-household growth

**WRE and its water company members and local authorities face a significant challenge when it comes to planning for non-household (NHH) growth. This is due to a number of factors:**

- Local authorities have difficulty in forecasting future non-household water demand for inclusion in development plans. It may not be clear whether for example warehousing with low water usage or businesses with very large water needs will occupy specific sites. Local plans therefore only provide an indication of future water needs.
- The water requirements of individual developments and sites can also change toward more water-intensive types between the local plan stage and when proposals come forward. For example, land earmarked for warehousing and storage in the local plan may end up being used for food manufacturing. Additionally, spaces may not be occupied until long after the development is completed, making it difficult to forecast usage and water demand until those units are let or sold.
- Businesses could seek to increase their use of public water supplies in response to their own abstraction licences being capped or reduced.
- There are potentially very significant new water requirements from emergent technologies and sectors, for example for data centres, green hydrogen production and carbon capture, usage and storage. Developers may seek access to the public water supply given the difficulty in securing new abstraction licences of their own.

“Without action to reduce water demand there is an increasing risk that future housing and business growth will be increasingly constrained by water availability. We are already starting to see this.”  
Waterwise (2023), ‘UK Water Efficiency Strategy to 2030’.

Where water resources are geographically constrained, new requests for more water from businesses and other NHH users may be refused until new supply options in the region become available.

- This is already the case in the Hartismere water resource zone in Essex & Suffolk Water’s area where there is a moratorium on new non-household water use until 2032.
- Requests in the Anglian Water region are considered on a case-by-case basis. Whilst provided where possible, the company is experiencing significantly higher NHH demand than predicted in its 2019 Water Resources Management Plan. During 2022/23 it received requests for an additional 90 Ml/d of NHH water use, which for context is more than the currently anticipated yield of the new Fens Reservoir. A large proportion of these new requests for water have had to be declined.
- Similarly, Cambridge Water has also seen a significant increase in non-household demand requests over the last few years, as the supply area becomes a growing hub for science and innovation. Each application has to be considered on a case-by-case basis. The Environment Agency has begun to object to some major planning applications for new housing development in the Greater Cambridge area due to risks of deterioration to local water bodies (see box on next page).
- Affinity Water’s Brett zone is not currently experiencing significant NHH growth.

Whilst difficult to meet new NHH growth in the short term, our plan can adapt over the medium to longer term based on the actual levels of growth observed within the region, and as projections change. The different growth scenarios and pathways to 2050 discussed later in this plan give us confidence that such growth can be accommodated as long as projections of non-household consumption improve - this is an early priority action in WRE’s new Business Plan for 2024 - 2028. For the 2024 round of WRMPs, all water companies have based their plans on their highest forecasts for non-household growth, but if this growth materialises it will not be possible to achieve the national target of a 9% reduction in non-household water consumption by 2038.



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### Supporting growth in Cambridgeshire

**Pressure on water resources from the significant housing and economic growth in Cambridgeshire hit the headlines in 2023.**

Cambridge is already one of the fastest growing cities in the country and this could accelerate under government plans. In July, the Secretary of State for Levelling Up, Housing and Communities launched a new [long-term plan for housing](#). This committed to delivering transformational change to Cambridge, alongside central London and Leeds, to make it 'Europe's science capital'. A new Cambridge Delivery Group has been formed to drive this forward.

The government's plans could involve the build-out rate for new housing in Greater Cambridge increasing significantly, from around 2,500 new homes per year in the emerging local plan to 15,000 per year on average between now and 2040. However, water scarcity will be a significant constraint with the [Environment Agency having objected to planning applications for thousands of homes](#) due to the risk of causing deterioration to local water bodies and chalk aquifers. As this plan shows, there is a paucity of new supply-side options available to Cambridge Water to help meet this degree of growth ahead of the Fens Reservoir coming into service.

Therefore, the Cambridge Delivery Group has formed a specific working group to address the water scarcity constraints. This is considering options to de-risk and accelerate the delivery of the Fens Reservoir as well as make planned developments such as Waterbeach and Hartree more water efficient. A £3 million fund will help support water efficiency projects in existing homes and buildings in order to relieve pressures and create headroom for growth.

WRE was invited to join the Water Scarcity Working Group from the outset and has been working closely with government, regulators and our water company members to consider options that will support the government's ambitions whilst protecting the environment.





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### What can households do to reduce consumption?

Nationally, average household consumption is currently 145 litres per person per day (l/p/d), having risen to a peak of 151 l/p/d during Covid-19.

However the average is skewed by a small proportion of relatively high household users; smart meter data suggests most households use less than 120 l/p/d. For more detail on the benefits of smart meters please see Section 5.

The chart to the right provides a breakdown of water use based on research conducted prior to the pandemic. This shows that showering and toilet flushing together account for almost half of daily water use, with hot water for showers, baths and hot taps together accounting for 40% of home water use. Reducing use of heated water helps reduce both energy and water bills for customers on a metered tariff.

#### Ways in which households (and businesses) can save water include:

- **Checking for leaking toilets:** 8% of toilets leak with faulty drop-valves in dual-flush cisterns the main culprit. Leaky loos can waste 400 litres of water per day or more almost invisibly, but can be [easily spotted and fixed](#). Overall, a third of leakage occurs within customer properties. Internal leaks are the property owners' responsibility to fix although some water companies offer advice and support.
- **Taking shorter showers and shallower baths:** Electric showers use less water than combi boiler-fed shower systems, with pumped power showers using the most water. New types of shower heads promise to achieve the same showering experience with as little as six litres of water per minute.
- **Buying water efficient white goods:** Use 'eco' settings on dishwashers and washing machines to use less water as well as energy. If you have one, a full dishwasher uses less water than washing-up by hand.

- **Reducing outdoor water use:** Instal a water butt to capture rain for watering plants. Containers and hanging baskets need much more water than plants planted in the ground. Drip irrigation systems direct water much more efficiently toward the roots, rather than being wasted on the leaves. Let your lawn go brown in the summer - hose pipes and sprinkler systems can use as much as 1,000 litres per hour. Also avoid using a jet washer on cars and patios, as these can use 400-600 litres per hour.
- **Reusing water:** Save washing-up water and the water from condenser tumble dryers for use in the garden or for watering indoor plants. Some people even stand in a large bucket when having a shower in order to capture the water for reuse.

More comprehensive water-saving advice can be found on the [Water's Worth Saving website](#). The government's role in helping to reduce household water use is discussed further in section 7.

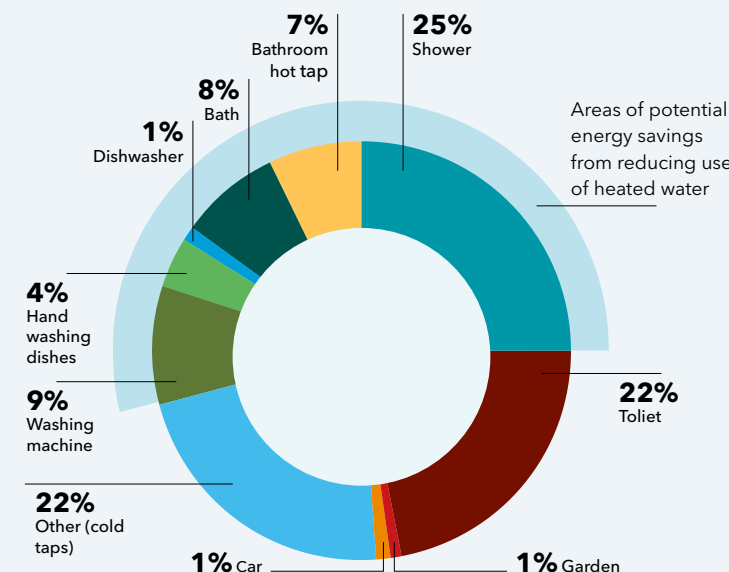


Figure 2.4: Breakdown of household water consumption

Chart data source: Energy Saving Trust (2013), [At home with water](#).



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## Securing water for lowland peat restoration

**WRE was an active member of the independent Lowland Agricultural Peat Task Force; a group established by Defra to explore ways of reducing greenhouse gas emissions from England's farmed lowland peatlands to support the UK's net-zero target.**

The task force [chair's final report](#) has now been published together with the [government's response](#). Peatlands in good health contain more than 90% water, and the science is clear that peatlands need to be under higher water table management regimes or sufficiently irrigated to minimise soil losses and greenhouse gas emissions. Ideally, water levels should be penned at around 5-10cm below the surface to minimise greenhouse gas emissions, even though this will be challenging to achieve on many sites and have consequences for continuing productive land use. Where this ideal scenario is impractical, each incremental 10cm increase in the water table reduces greenhouse gas emissions from the land by three tonnes of CO<sub>2</sub>e per hectare per year.

**Whilst impossible to quantify at this stage, it is clear that more water needs to be stored and managed in the landscape to sustain wetter peatland soils. However, shortages of water should not be seen in general as a barrier to more sustainable peatland management.** The implications for water resources, water quality and local levels of flood risk will need to be assessed on a site-by-site basis. In some cases, if for example the peat soils sit within a natural depression, this will be a simple matter of penning water at higher levels within the local drainage system. In other cases significant additional volumes of water would be needed to create and sustain a wetter soil regime. Surface irrigation or mulching could offer alternative approaches. In all cases, the implications for local flood risk management and drainage regimes will need to be considered, as will the potential for nutrients and other pollutants to be flushed out if the land was previously intensively-managed.

**We will continue to help develop the evidence base to support water for sustainable peatland management within future iterations of our regional plan. In the meantime, we were pleased to see the government endorse all of the task force's recommendations.** In their response, the government recognised the importance of new water level management plans being tied to the local nature recovery strategies being developed by local authorities with partners over the coming months. As our draft plan suggested, the government's response also recognised the need for new incentives and funding sources to support the transition toward more sustainable use of lowland peat soils. These include the Sustainable Farming Incentive and funding from carbon markets that will hopefully come forward under the revised [IUCN Peatland Code](#). The response also promoted the role of paludiculture, or wetland farming, with several trials underway including a [Nature for Climate](#) project in Norfolk led by the Broads Authority. Such pilots suggest a strong role for IDBs in creating innovative ways to recirculate water through wetland landscapes often using low-cost, low-tech approaches as well as state-of-the-art telemetry and pumping systems.



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By far the biggest driver for additional water resources in future arises from the need to restore more natural water levels and river flows to support healthy ecology and environmental resilience. This will require all sectors to abstract less from sensitive ground and surface water sources, and replace the volumes lost with more storage and other sustainable water supplies.

Water companies have also been tasked with increasing the resilience of their water supplies so that severe drought restrictions become an even rarer event, despite climate change making rainfall less dependable.

- **Licence capping:** In the short- to medium-term, returns to the environment will be driven by the Environment Agency's Restoring Sustainable Abstraction programme and to ensure that existing abstraction licences do not cause the ecological health of waterbodies to deteriorate (i.e. to meet the 'no deterioration' requirement under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
- **Environmental Destination:** In the longer-term, returns to the environment will be driven by the need to achieve flows within waterbodies that support good ecological status; including within headwaters, chalk rivers, wetlands and protected habitats.

## Licence capping to avoid environmental deterioration

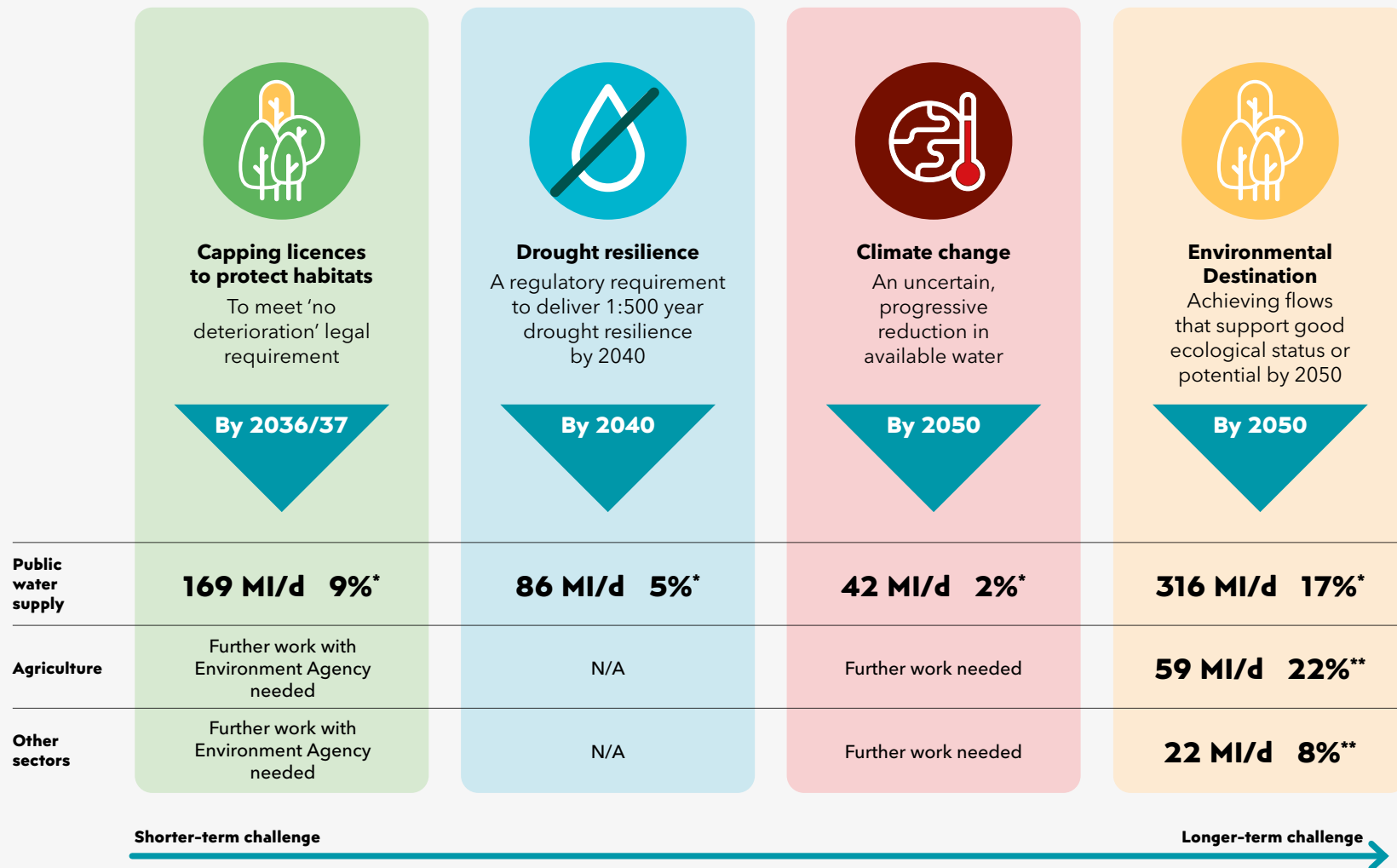
**Current abstraction licences for all sectors are in the process of being reviewed under the Environment Agency's environmental protection and restoration strategies including 'Restoring Sustainable Abstraction'. The Environment Agency will prioritise changes to licences where abstraction risks the greatest detrimental impact on nature.** This is due to the UK's obligations under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 to achieve good ecological status of waterbodies and to prevent deterioration to water-dependent habitats.

- Water companies have already been informed by the Environment Agency that as a minimum, their abstraction licences will be capped to historic peak use ('max peak'), as measured over a standard reference period. In some cases, where significant growth is projected, licences will be capped at a much more stringent 'recent actual average level'. Combined, these changes are projected to reduce water companies' licenced volumes by 169 Ml/d (9%).
- Licence caps will also be placed on other sectors, most likely on a 'max peak' basis but in some cases further restrictions will be necessary to avoid existing harm or future deterioration. For example, around 20 abstractors in the Ant Valley in Norfolk are due to have their licences severely curtailed or withdrawn altogether by October 2024 to prevent further harm to local designated habitats. Abstractors have 28 days to lodge an appeal following notice of changes to licence conditions, with changes otherwise imposed on the specified date.
- The power sector could be impacted too and is potentially very sensitive to reductions. This is because even a small restriction in peak use could be enough to prevent an entire generation unit from operating, reducing the station's ability to contribute to electricity system security.

**Many of the potential changes to licences mentioned above are not yet known and understood, especially within the agri-food sector. This restricts the sector's ability to plan for the changes required.** This not only puts pressure on businesses but also on food supply chains, the economy, employment and communities. Further reviews to time-limited licences will follow in accordance with common end dates in the Environment Agency's [Abstraction Licence Strategies](#) from 2025 onwards. This will see abstraction licences reviewed on a catchment-by-catchment basis (see Table 3.1) and possibly varied. Under the Environment Act 2021, from 1st January 2028, no compensation will be payable to licence holders should permanent abstraction licences be varied if they pose a risk to the environment (as is already the case for public water supply licences). The agri-food sector, in particular, needs more support in planning for these changes. This includes access to information and guidance, and time to understand the implications and put in place appropriate measures to ensure resilient water supplies are available to support food production going forward.

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Figure 3.1: Reduction in water availability – meeting environmental targets, climate change and increasing drought resilience



\* % of Public Water Supply Water available for use in 2025 \*\* % of Projected demand in 2050



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## Will licence caps deliver improvements to the environment, or do they amount to ‘paper water’ reductions?

**The Environment Agency’s abstraction reform programme has been underway for more than a decade. Changes are in train to continue to review both time-limited and permanent licences.**

This process can result in caps being imposed to avoid current harm, the potential for future harm, or the deterioration of waterbody health should the current level of abstraction continue. In extreme cases current licences can be withdrawn altogether. All licences are due to become permits under the Environmental Permitting Regime in 2024. In effect this will make all licences time-limited, as it is proposed that permitted volumes and restrictions are reviewed every six years.

### When imposed, licence caps can:

- Reduce volumes to ‘Max Peak’ consumption: this reduces the potential for over-abstraction by removing unused headroom in existing licences.
- Reduce volumes to ‘Recent Actual Average’ consumption: this achieves deeper licence reductions to limit abstraction to no more than the average of recent years’ usage.
- Include ‘Hands-Off Flow’ (HOF) conditions: in combination with either of the above, or imposed independently, HOF restrictions apply when river levels and flows fall below defined thresholds.

All three approaches achieve improved protection for the environment, particularly during dry periods. In the past, ‘Max Peak’ licence caps have been criticised by environmental stakeholders as amounting to ‘paper water’ cuts because in theory they allow historic levels of abstraction to continue.

However, the fixed reference period used to assess historic use may not have included past years of high demand. The caps also eat into the volume of water that water companies and other abstractors may be relying on to meet their growth plans and supply resilience standards, or that is held as contingency to cover for unexpected increases in demand (such as seen during the Covid pandemic).

The imposition of ‘Max Peak’ caps will therefore trigger additional investment by abstractors to meet their future water needs, which will need to be from new and more sustainable sources. Having more sustainable sources of supply available means that abstractors can rely less on their previous, more environmentally sensitive, water sources – using them only as a last resort.

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Table 3.1: Common end dates for abstraction licences

Abstraction licencing strategy area	Current common end date	Next common end date
Old Bedford including Middle Level	31 March 2025	31 March 2037
East Suffolk	31 March 2026	31 March 2038
Welland	31 March 2026	31 March 2038
Cam and Ely Ouse	31 March 2027	31 March 2039
Essex	31 March 2028	31 March 2040
Roding, Beam, Ingrebourne and Mardyke	31 March 2028	31 March 2040
Upper Ouse and Bedford Ouse	31 March 2028	31 March 2040
Steeping, Great Eau and Long Eau	31 March 2028	31 March 2040
Witham	31 March 2028	31 March 2040
North Norfolk	31 March 2029	31 March 2041
Nene	31 March 2029	31 March 2041
Broadland Rivers	31 March 2030	31 March 2042
North West Norfolk	31 March 2030	31 March 2042
Grimsby, Ancholme and Louth	31 March 2030	31 March 2042

## Long-term Environmental Destination scenarios

Several 'Environmental Destination' scenarios for achieving healthy flows within waterbodies were originally defined in the 2020 National Framework for Water Resources. We have continued to work with our regulators to clarify these scenarios so that we plan on a consistent basis with the other regional groups and deliver as much environmental enhancement as possible. Table 3.2 describes the three Environmental Destination scenarios we have used to inform our planning. Use of scenarios like these allow us to explore the effect on our supply demand balance of uncertainties associated with complicated decisions that will be made over the coming planning cycles. Such decisions will be informed by more detailed multi-sector investigations, and an updated and more holistic cost-benefit assessment of local environmental objectives and possible multi-sector solutions, alongside the opportunity costs and disbenefits of licences being withdrawn. WRE has no power to enforce or implement the changes to licences that might be needed - this is for the regulators and licence holders to determine - but our plan sets out the overall scale of the challenge across sectors and the shape of investment and actions that could facilitate the delivery of these environmental outcomes.

The 'Resilience' (BAU+) scenario, which for now underpins our core regional plan, has been described by the Environment Agency as 'the best predictor of the minimum planning requirement' for long-term abstraction reform. This scenario focuses on achieving environmental flows that support good status for all water bodies that have this as an environmental objective in the current River Basin Management Plans. It also includes additional protection for internationally designated sites, such as many of our important wetlands. As explained on page 15, this scenario is used for our core planning pathway because it aligns with the other regional groups at a national level for consistency, and is more robust having been subject to a greater degree of local scrutiny by water companies, the Environment Agency and Natural England. However it should be noted that as well as being WRE's stated ambition, some stakeholders consider the 'Enhance' scenario to be the statutory minimum level of environmental improvement, as it is only under this scenario that the elevated water-related targets of UK designated habitats are met.

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Table 3.2: Environmental Destination definitions and requirements

Environmental Destination	Definition	Water returns to the environment needed by 2050
<b>'Recover' (BAU):</b> Support the <b>recovery</b> of degraded rivers and water-dependent environments to meet existing targets and prevent further deterioration.	Achieve sufficient flows in waterbodies to support 'Good' ecological status or potential, apart from waterbodies considered uneconomic to improve within River Basin Management Plans (RBMPs).	311 Ml/d of which: <ul style="list-style-type: none"> <li>Public water supply: 238*</li> <li>Power: 0</li> <li>Agriculture: 51</li> <li>Other: 21</li> </ul>
<b>'Resilience' (BAU+):</b> Secure the <b>resilience</b> of internationally important habitats .	As 'BAU', with extra protection for European Protected Sites.	397 Ml/d of which: <ul style="list-style-type: none"> <li>Public water supply: 316*</li> <li>Power: 0</li> <li>Agriculture: 59</li> <li>Other: 22</li> </ul>
<b>'Enhance':</b> <b>Enhance</b> the region's headwaters, chalk rivers and nationally important habitats.	Achieve flows to support 'Good' in all waterbodies including those considered uneconomic within RBMPs. <ul style="list-style-type: none"> <li>Extra protection for European Protected Sites.</li> <li>Enhanced protection for chalk streams, sensitive headwaters and SSSIs.</li> </ul>	897 Ml/d of which: <ul style="list-style-type: none"> <li>Public water supply: 741*</li> <li>Power: 0</li> <li>Agriculture: 100</li> <li>Other: 56</li> </ul>

\*Public water supply figures reflect reduction in Water Available for Use as a result of potential licence reductions



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**Importantly, actions and investments scheduled for the first five years to 2030 are the same irrespective of whether the ultimate Environmental Destination is 'Recover' (BAU), 'Resilience' (BAU+) or 'Enhance'.** In Section 6 we set out the additional investments that would be needed after 2030 to step up from our current core pathway to one that would achieve the 'Enhance' scenario. When finalising our next plan, in around 2028, we will need to set the natural capital benefits of adopting 'Enhance' as our core pathway against the costs and environmental trade-offs of achieving it, given the likely reliance on additional desalination, pumping and treatment, and the associated environmental and carbon impacts of this.

**In practice, the level of long-term abstraction reduction imposed by regulators is likely to differ across individual waterbodies and catchments, informed by the results of more detailed investigations to begin in 2024.** In some areas the economic and environmental impacts of achieving 'Enhance' through abstraction reform alone will be too great to justify. Instead, the desired environmental outcomes could be achieved through a combination of abstraction reform and complementary actions that restore river systems and help increase groundwater infiltration, for example through land-use change, nature-based solutions and options such as managed aquifer recharge. Regional groups like WRE can play an important independent role in facilitating this multi-disciplinary, cross-sector work, as we already are through the Norfolk Water Strategy Programme. Each water company in the region has sought funding in their PR24 business plans to commission investigations that will consider how best to achieve the desired Environmental Destination outcomes. WRE has requested funding from the Environment Agency to make sure these studies generate the datasets needed by all sectors to plan on a long-term basis.

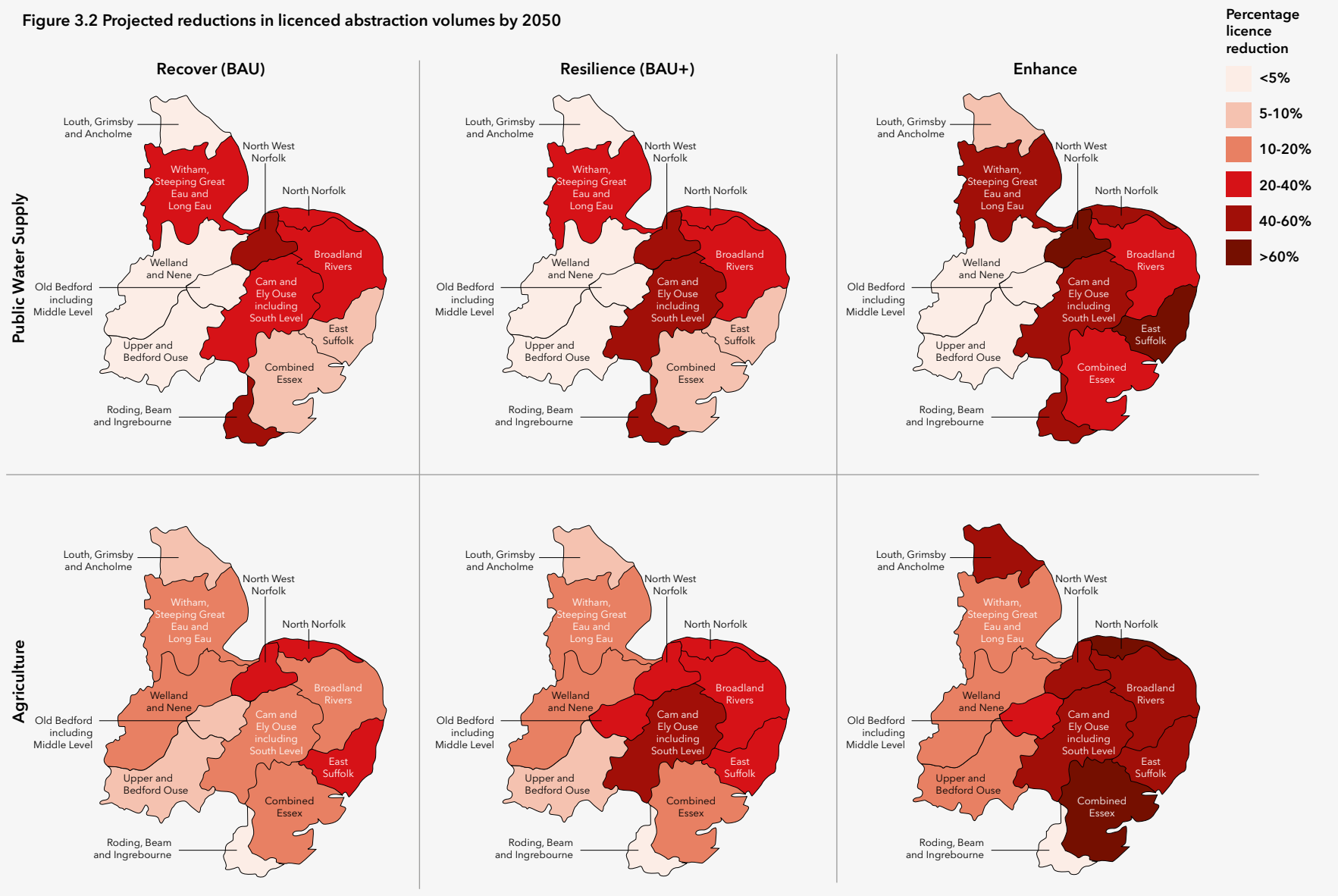
## More resilient public water supplies

**Water companies have been tasked by the government and regulators to increase the resilience of public water supplies to drought conditions.** Water companies are already investing so that by 2025, there should be less than a 0.5% (1 in 200) chance of severe drought restrictions such as rota cuts being needed in any given year. Defra's Strategic Policy Statement to Ofwat for the 2024 Price Review requires companies to reduce this to a 0.2% (1 in 500) annual chance, with the aim to achieve this by 2040.

- Achieving this level of drought resilience means more investment in water storage and other sources of water supply such as transfers, reuse and desalination.
- The 1 in 500 standard of drought resilience requires in total an extra 86 Ml/d (5%) in water supplies to be secured by the target date of 2040.

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Figure 3.2 Projected reductions in licenced abstraction volumes by 2050





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## Adapting to climate change impacts

**The changing climate toward warmer seasonal as well as extreme temperatures means soils will dry out more quickly, more water will be lost to evaporation, and rainfall will become less reliable. Extended periods of both wetter and drier weather are becoming increasingly likely.** The rain that does fall in the east is likely to arrive in heavier bursts, with longer dry spells and harsher and more frequent drought and saline incursion conditions being experienced. Climate change therefore also implies more water storage is needed by all sectors to be able to manage through the peaks and troughs in more variable seasonal rainfall and to counter higher evapotranspiration.

- Allowances for climate change and changing rainfall patterns are based on the latest UK climate projections 2018 (UKCP18) with the plan tested against a range of future climate scenarios.
- Climate change may reduce the output of existing public water supply sources by an additional 42 Ml/d (2%) between now and 2050.

## What will achieving the Environmental Destination scenarios mean for abstraction?

The Environmental Destination scenarios are focused on achieving more reliable base flows that meet Environmental Flow Indicators (EFI), and in doing so, support healthier and more resilient ecosystems. Whilst the scenarios at present focus solely on reducing abstraction, in practice they should be achieved through a combination of interventions to restore more natural processes within water bodies. The proposed Water Industry National Environment Programme (WINEP) Environmental Destination investigations will consider how best to achieve the EFIs in ways that maximise co-benefits and minimise costs and impacts.

In advance of these investigations our modelling has to assume that ED scenarios are met through changes to abstraction alone. Whilst this is a simplification, abstractors should expect the following general changes:

- Surface water abstraction becoming increasingly restricted by Hands Off Flow conditions, as the trigger levels will be met more frequently as the climate changes.
- Reduced groundwater abstraction in the upper reaches of catchments to support increased flows in sensitive headwaters and further downstream.
- Potentially a shift in surface water abstraction volumes toward the lower reaches of catchments to leave water in rivers for longer.
- Less abstraction from both ground and surface water sources during the warmer spring, summer and autumn months, with potentially more abstraction possible during the winter months (up to licenced volumes) for storage and later use.

The maps below show where and when existing water company abstraction licence volumes are due to be reduced, first to prevent deterioration (left) and then to achieve Environmental Destination improvements in flows (right). The timescales shown have been informed by two main factors: the presence of sensitive water-dependent habitats, and the ability to bring forward new supply options to replace the water being returned to the environment.

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## To prevent deterioration

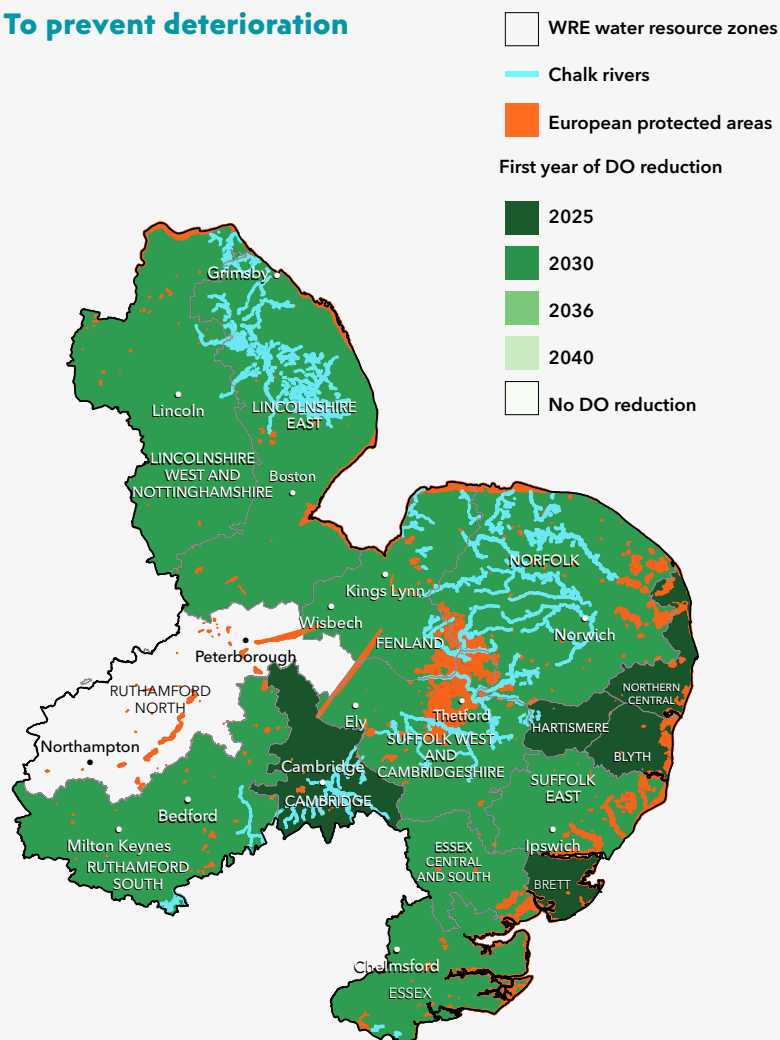
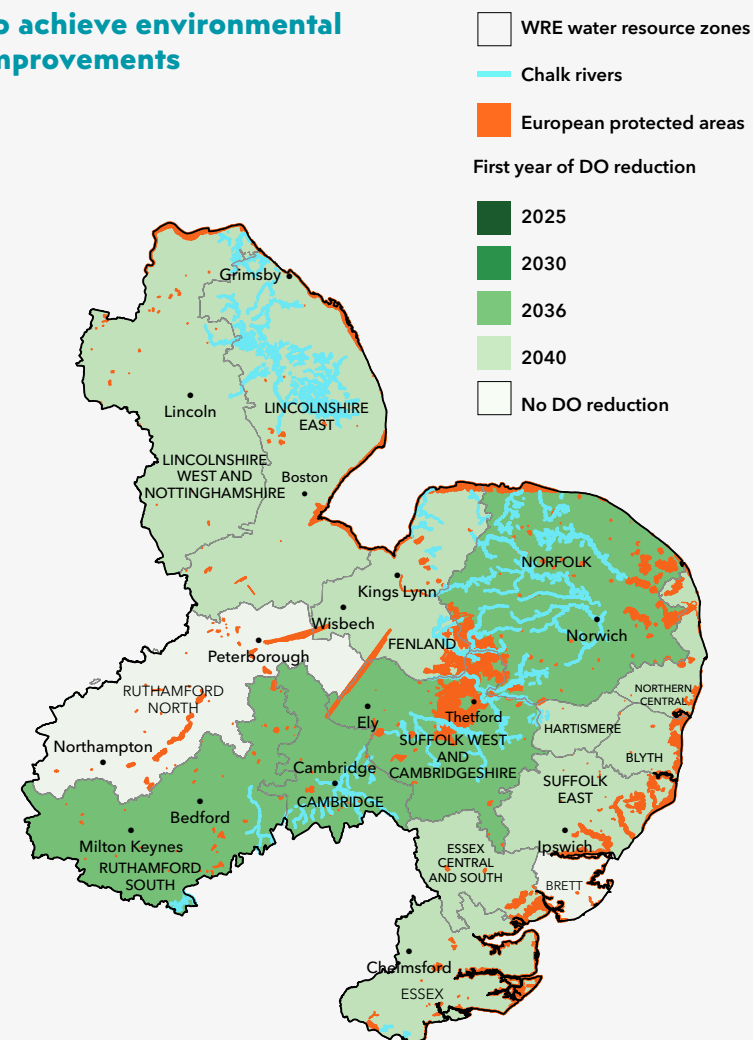


Figure 3.3: Timetable for reducing abstraction licence volumes

## To achieve environmental improvements





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The previous two sections describe how the demand for water is increasing whilst climate change, improved drought resilience standards, and the need to restore the environment means less water will be available to abstract.

Demand is already exceeding the amount of water available in some parts of Eastern England, and requests for new connections are having to be declined. Our regional plan describes what needs to be done to address this challenge.

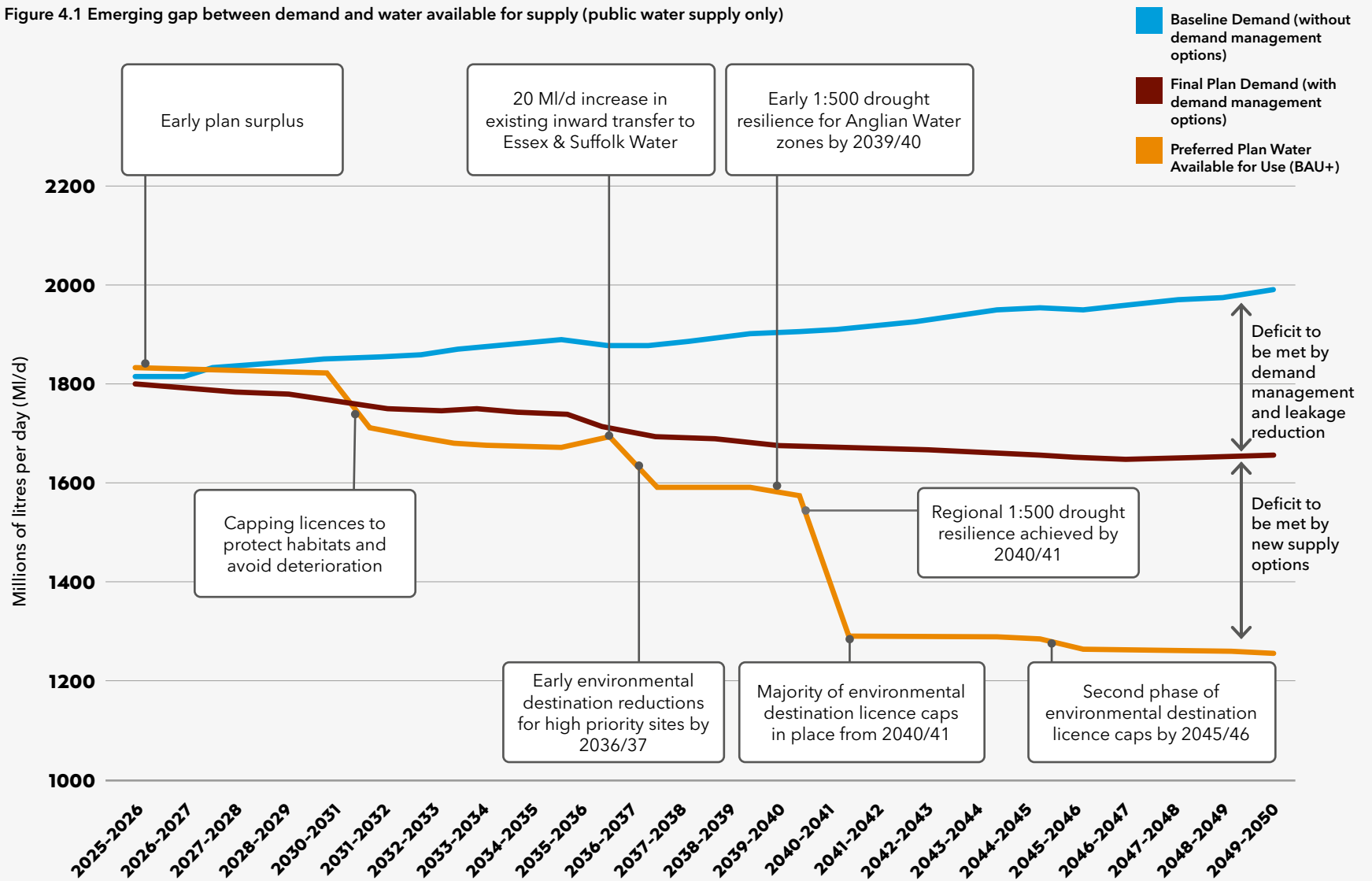
**Figure 4.1 shows the supply-demand gap for the public water supply through to 2050, highlighting that a regional-scale deficit emerges by 2030 and then grows significantly as abstraction licences are curtailed.** Whilst the solid blue line shows how demand increases due to population and economic growth, this is more than offset through the demand management approaches described in this plan (see red line). However, the orange line shows how the amount of water available from existing sources falls sharply away.

- Water companies in the region will begin the planning period in 2025 with only a minor surplus in water supplies beyond the minimum buffer ('headroom') required to cater for current and future uncertainties in supply and demand. With demand management options the small surplus remains until 'no deterioration' licence caps are imposed in 2030. The resulting deficit must then be met by new supply side options.

- Water companies in the region have less scope than elsewhere in the country to drive down leakage even further and to accelerate water demand management strategies. Anglian Water and Cambridge Water already have amongst the lowest level of leakage in the UK with Essex & Suffolk Water not far behind. Between them they supply 98% of the population in the region. WRE's water companies already have a high proportion of water customers on metered tariffs, with plans to roll out smart metering that will help reduce both consumption and leakage further.
- New requests for water from businesses and other non-household (NHH) users above the level factored into water company plans may be refused until new supply options in the region become available.
- Farmers and other abstractors typically have little water storage on site and therefore take the water they need from ground and surface water sources as and when they need it. This needs to change in order to make better use of higher river flows during the winter and store the available water for irrigation during the spring and summer months. The Water for Food Group has commissioned a template and guidance to help irrigators to develop farm and catchment-scale water resources management plans and drought management plans to consider in detail the changes needed.

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Figure 4.1 Emerging gap between demand and water available for supply (public water supply only)





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## Developing our plan

Our plan involves reducing the demand for water across users, bringing leakage down even further to record low levels, while developing two major new storage reservoirs and other supply options that make better and more sustainable use of the region's water resources. Detailed modelling and analysis commissioned by WRE shows that the projected supply-demand deficits can be bridged in a number of ways.

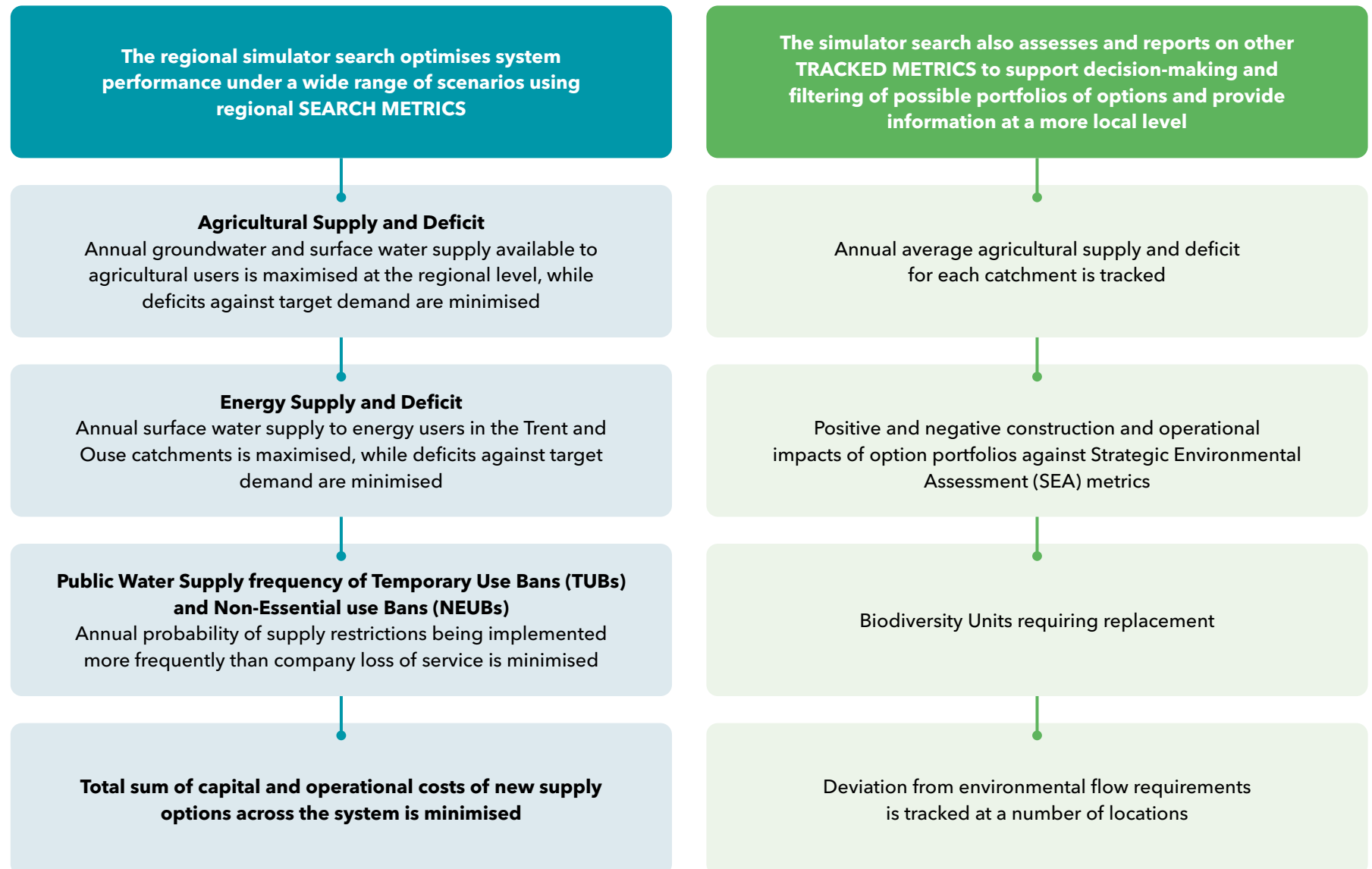
Our approach identifies from a long list of options those that score best against an agreed set of multi-sector performance metrics and benefits for the environment when compared to their whole-life costs (see Figure 5.2 on next page). Findings from the plan's integrated environmental assessment process also help assess the potential for unintended environmental risks as well as improvement opportunities related to each of the strategic options, in both isolation and combination. In this way we arrive at a 'best value' plan, rather than a 'least cost' plan. A least cost plan would sacrifice important elements in order to keep costs down.



Figure 5.1: WRE's best value planning framework

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Figure 5.2: Multi-sector metrics used to build optimal portfolios of supply-side options





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- First we factor in how much water can cost-effectively be saved through leakage and other demand-side measures such as water efficiency campaigns and installing smart meters. However, demand management and leakage control become disproportionately more difficult and expensive the more that performance is improved. Therefore new supply options also need to be brought online at the right time to avoid deficits emerging during the 25-year planning period.
- We then test how well each portfolio of supply-side options perform in a range of future growth, climate change and demand scenarios. The options we propose in our plan are those that would make sense to implement almost regardless of what the future might bring.
- We also consider whether more water could be transferred between the WRE region and adjacent regional planning areas. The merits of such transfers have been tested with the other four regional groups as part of a 'regional reconciliation' process, with a further round taking place since the draft plan stage. The regional groups took turns to present their respective options and proposals to make sure all groups' plans complement each other in the national interest. As a result of that process, our core plan involves no additional transfers of water to other parts of the country given the region's water-stressed status and a preference for Water Resources South East to receive water from the Water Resources West region. However, this inter-regional process identified the potential for a 'reverse trade' of the existing transfer between Anglian Water and Affinity Water that frees up capacity for Anglian Water to supply Cambridge Water instead. This would be on an interim basis from 2032, until the Fens Reservoir comes online.
- Due to constraints in funding for our Technical Programme, our analysis has focused on meeting deficits in the public water supply. However, the options within the plan have been selected due to the co-benefits they deliver for other sectors including farming and energy production, as well as to limit the overall carbon and environmental impacts of building the options themselves.
- The agricultural sector currently does not have a statutory requirement to create Water Resources Management Plans in the same way as water companies. In line with our recommendations at the draft plan stage, Defra and the Environment Agency have since worked with the NFU and abstractor groups to fund and develop water resources and drought planning guidance and templates for the agri-food sector. These will help farm businesses work individually and as part of abstractor groups to plan for their future water resource needs and to improve their resilience to drought. Both planning templates aim to be consistent with water company frameworks so that the results can be integrated into our next regional plan.

## The Accelerated Infrastructure Delivery scheme

Following the extended dry weather and drought of 2022, the government asked Ofwat to explore opportunities to bring forward water company investment in demand management activity and new sources of supply that would achieve benefits by 2030 – the Accelerated Infrastructure Delivery (AID) scheme. Ofwat consulted on proposals in April and announced [final decisions in June 2023](#).

This plan takes account of the additional early investment that Ofwat approved as part of the exercise, including:

- Anglian Water: bringing forward delivery of 60,000 smart meters and accelerating design work on the Colchester re-use scheme in a way that will benefit reuse projects in ours and other regional plans.
- Essex & Suffolk Water: a new borehole and water treatment works at Linford, and design work on the Suffolk Strategic Network and Storage Scheme, to help alleviate pressure on resources in the Hartismere zone.
- Cambridge Water: early installation of smart meters for both household and non-household customers.

Following [WRE representation](#) at the draft decisions stage, funding to allow Essex & Suffolk Water to accelerate design work for the North Suffolk Winter Storage Reservoir and the Lowestoft reuse scheme was also approved.



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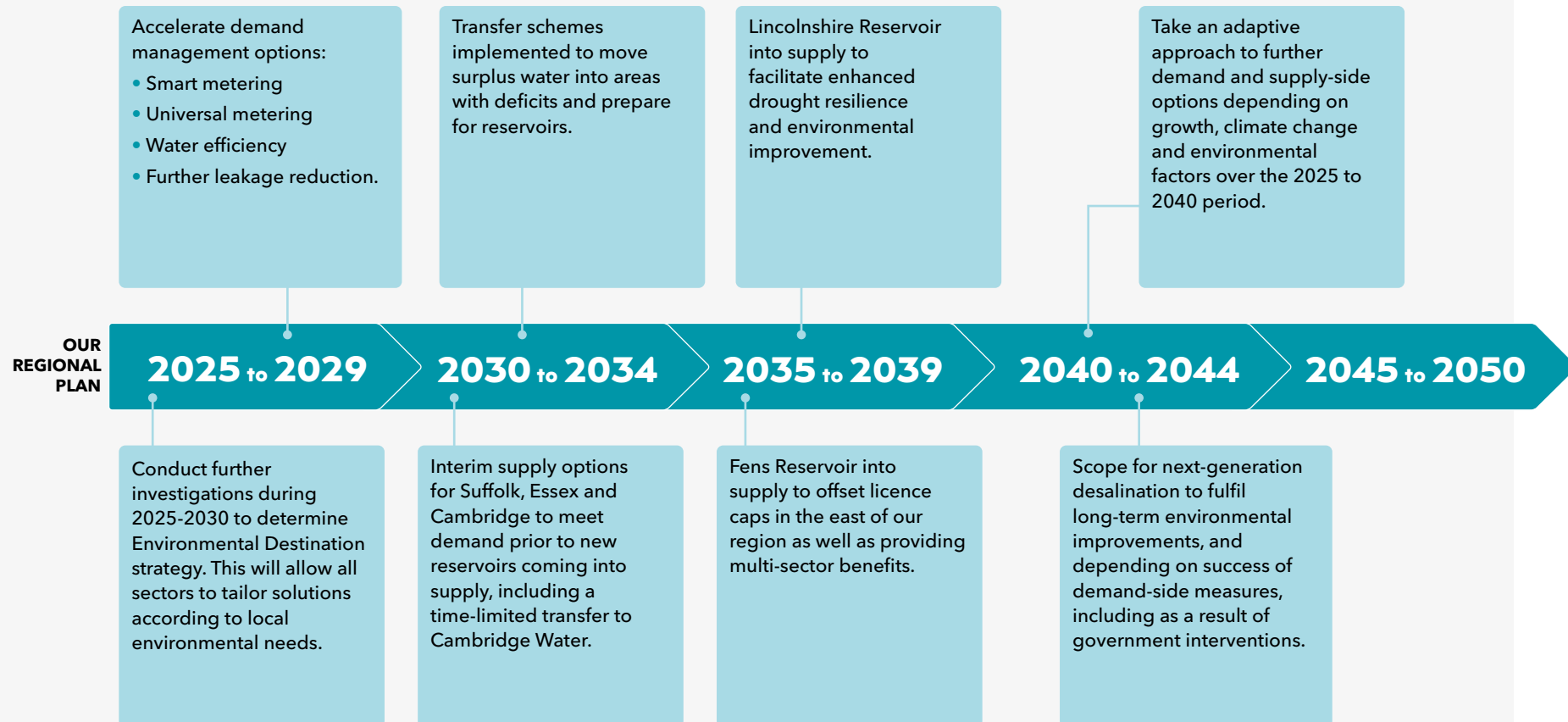
**The core pathway presented in this plan is designed to deliver as much as possible against the environmental, drought resilience and demand management requirements and expectations set by government and regulators. The plan achieves:**

- A near full regional contribution to the statutory national water saving target to reduce overall public water supply use per capita by 2038 (19.1% versus the 20% target), plus fully meeting the per capita consumption target of 110l/p/d by 2050. Significant further action is also planned toward the national targets on leakage reduction and non-household consumption. But strong regional growth and already low levels of leakage make higher ambition on these targets beyond reach at this stage.
- Delivery of the 'Resilience' (BAU+) Environmental Destination scenario as quickly as possible in priority catchments and waterbodies, and across almost the entire region by 2040. This cannot be brought forward any earlier at this stage because water companies will remain reliant on existing abstraction licences until new supply-side options, often with long lead times, come online.
- The required 1:500 drought resilience standard for the public water supply by 2040. The government asked water companies earlier this year to consider a scenario that delayed achieving this standard to reduce short-term pressure on water bills. However, the schemes that underpin improved drought resilience are needed by 2040 to meet environmental requirements, and it makes sense to size such options to achieve 1:500 drought resilience at the same time.



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Figure 5.3: Our Regional Plan



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Figure 5.4: Elements of our Regional Plan for the public water supply, under the 'Resilience' (BAU+) Environmental Destination scenario

## Demand management c.333 MI/d reduction

- Government interventions deliver approx 114 MI/d demand savings (35% of total regional demand saving).
- Reduction in per capita consumption from 135 l/p/d to 110 l/p/d in 2050.
- Reduction in regional distribution input per capita by 19.1% by 2038.
- 39% leakage reduction from already industry-leading levels.
- Increase in metering penetration, with full roll out of smart metering by Anglian Water by 2030, Essex & Suffolk Water and Cambridge Water by 2035, and Affinity Water by 2040.
- Regional reduction in non-household demand by approx 13% (relative to growth) in 2050.

## Supply option capacity c.485 MI/d



### Reservoir storage c. 280 MI/d

Fens Reservoir into supply by 2035-2037 to support delivery of abstraction licence cap reductions.

Lincolnshire Reservoir into supply by 2039-2041 supports delivery of drought resilience and Environmental Destination.

A smaller winter storage reservoir in North Suffolk by 2040.



### Desalination c. 110 MI/d

Likely need for schemes in Essex, Norfolk and Lincolnshire supporting longer term environmental goals from 2040.



### Effluent water reuse c. 23 MI/d

15 MI/d from reuse schemes needed by early 2030s to balance supply and demand as licence caps are imposed.

An additional reuse option may be required by Essex & Suffolk Water in response to possible Habitat Regulations licence caps.



### Smaller options and transfers c. 75 MI/d

A range of company-level supply schemes are needed by the early 2030s.

Transfers are developed early in the plan for water to be moved from new schemes to where it's needed.



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## Approach to demand management

Improving water efficiency and reducing water demand should be a priority for all sectors. Data from the Office of National Statistics (ONS) shows that, since the 2011 census, the population of the East of England has grown by 8.3%, the highest level in the UK.

This is equivalent to an increase of approximately 488,000 additional residents. Rapid population and household growth is expected to continue over the next 25 years. If unmanaged, this will drive up water demand to unsustainable levels.

**Ways to manage demand and reduce public water supply consumption include:**

- reducing leakage and other water wastage;
- making water-using products, appliances and processes as efficient as possible supported by consumer labelling and minimum product standards;
- capturing rainwater and reusing wastewater for non-potable needs such as irrigation, dust suppression, flushing toilets and washing cars; and
- changing behaviours so that the frequency and duration of water-intensive activity is reduced, including through temporary usage bans during times of drought.

**There is already considerable effort being invested to reduce water demand. However, given the significant challenges our region faces, there is more that could be done by all sectors to offset growth and reduce future water requirements.** The National Framework for Water Resources and the National Infrastructure Commission (NIC) both emphasise how important it is to understand the demand for water, and that demand management should form a key element of both this regional plan and water company WRMPs.

- **Water companies:** have pursued demand management strategies for more than thirty years. As a result, Essex & Suffolk Water and Anglian Water put the same amount of water into supply now as they did in 1990 despite housing and economic growth since then. Nevertheless, water companies continue to push ambitious demand management approaches, as outlined in their revised draft WRMPs. WRE is working closely with water companies to encourage high ambitions and we will track their progress against key metrics every year (see Box on page 73, Section 6).
- **Non-household (NHH):** Non-household consumption accounts for approximately 24% of public water supply demand across the WRE region in 2025, increasing to 26% by 2050. However, this demand is not evenly distributed across the region and is often concentrated in already water stressed and highly populated areas. Historically non-household demand has been relatively low and stable allowing increases to be accommodated in water company headroom. However, as discussed in Section 2, in recent years non-household demand for the public water supply has grown at an unprecedented rate. This demand is very difficult to forecast due to lack of visibility of developers' plans as well as the variability of the wider socio-economic environment. WRE is an active member of conversations regarding NHH growth in the region and seeks to join up work across companies and sectors where possible.
- **Agriculture:** Water restrictions and challenges to supply resilience are leading farmers and growers to invest in more efficient spray and drip irrigation systems, rainwater harvesting, and altering crop rotations toward less water-dependent crops and varieties. WRE is supporting work by Cranfield University and the Water for Food Group to further enhance understanding of agricultural water demand and what the sector can do to increase their supply resilience.
- **Energy and power production:** Water demand for power production has fallen due to less fossil fuel power generation driven by the government's net zero strategy and commitment to decarbonise the UK power sector by 2035. Longer-term projections of water demand depend on the balance between renewables, nuclear and use of carbon capture, usage and storage, and how much freshwater is needed for green hydrogen production in the region. WRE is working with Energy UK, Hydrogen East and Net Zero East to continue to understand the energy sectors' water demands and how we can support the sector to be as efficient as possible with its water use.



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- **Industrial abstractors:** There are individual good examples of demand-side action by industrial water users, but the low unit cost of water means incentives to take action are weak. Even with abstraction licence fees being reformed to be based on the volumes of water abstracted, rather than administration costs, water conservation measures in future may well be driven by the imposition of licence caps and conditions such as Hands-off Flow restrictions. WRE is seeking to engage with businesses and non-household abstractors to better understand and influence their future water behaviours.

**For all water users, having water consumption regularly measured and reported, and paying charges based on actual consumption, are important components of any water efficiency strategy.** That is why smart metering programmes for all sectors will be key to future demand-side action, with meters becoming compulsory in some areas. Measuring consumption at least hourly and making that data available to users can underpin leakage control strategies as well as behaviour change initiatives. Ideally, the price paid for water per unit should reflect its scarcity at that time. In the future, smart water metering could allow such pricing strategies to emerge in the same way that dynamic, variable pricing is a feature of some smart energy tariffs.

**Demand management activities are embedded in our core plan to ensure demand for water is reduced in the future, complementing our proposed supply side options.** These activities have been reviewed for the final plan and enhanced so that they more fully align with national governmental targets. Ofwat expects regional plans to encourage water companies to meet ambitious demand targets as described in the graphic on the next page.

## The benefit of smart meters

It has long been known that households paying a metered tariff use less water on average than those on unmetered tariffs. There may be some self-selection in this, as typically it is lower consuming households that benefit more from installing a meter. Nevertheless, there are further savings available from both increasing the penetration of metering toward all households whilst at the same time replacing existing 'dumb' meters that need to be read manually with smart meters that can be read remotely and much more frequently, typically hourly.

Smart meters are now a vital part of water company demand management strategies focused on reducing per capita consumption (PCC) and leakage by 2050. All four water companies have begun to rollout smart meters so that the majority of the region will be smart metered by 2030, with near complete coverage of household and non-household water use by 2035.

For its revised draft WRMP24, Anglian Water analysed data from approximately 150,000 smart metered properties with more than a full year of continuous data. This showed that smart meters deliver:

- a 2% reduction in household consumption from changes in customer behaviour;
- an average reduction of 3% in household consumption due to the timely identification of internal plumbing loss leaks that were then repaired by customers; and
- an average reduction of 2% in household consumption due to the timely identification of customer supply pipe leaks. These savings count toward company leakage reduction targets rather than per capita consumption - a reduction in customer-side plumbing losses (CSPL).

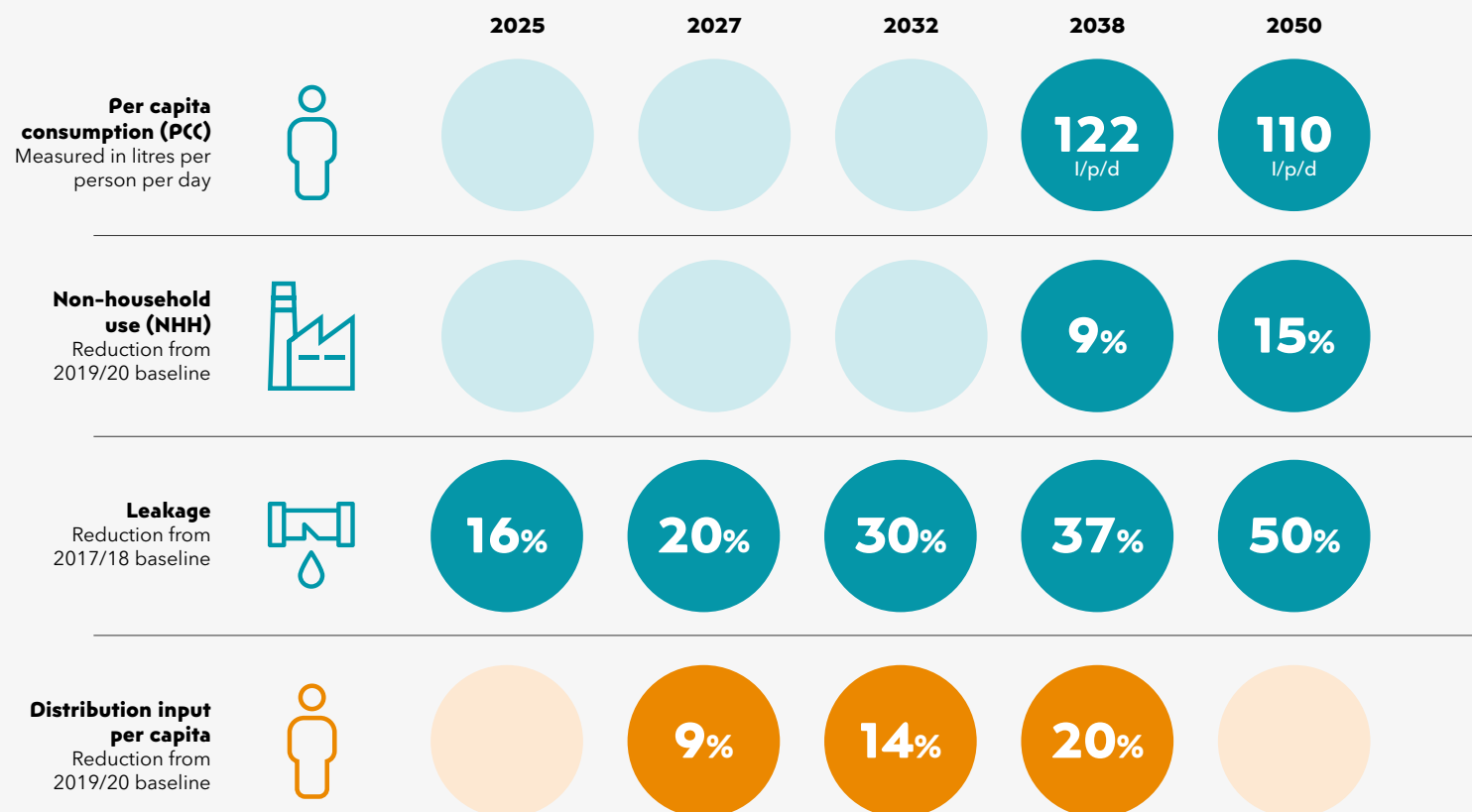
However, New Appointment and Variation (NAV) companies - who win contracts to provide water services to new housing developments - are not required to fit smart meters. Where they are, they may be using smart meters and data technologies that differ to the four wholesale water companies operating in the region. This could cause interoperability issues as well as undermine the potential water savings available. We will work with the Independent Networks Association, who recently joined WRE as a member and represents the NAV companies, to develop a smart metering strategy that complements wholesalers' plans.

## Targets for reducing water use

Defra's Plan for Water expanded on the national, statutory water saving target to set a trajectory toward 2038 with interim targets of a 9% reduction in Distribution Input (DI) per capita by 2027 and a 14% reduction by 2032.

Individual targets were set for reducing leakage, non-household demand and per capita household consumption within the Environmental Improvement Plan (EIP), and echoed within the Plan for Water.

Figure 5.5: Summary of long-term and interim targets for water consumption in England





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Table 5.1: Demand management statistics, including performance against the Environmental Improvement Plan 2023 targets for water companies and WRE regional totals

			TARGET	Unit	Anglian Water	Essex & Suffolk Water	Cambridge Water	Affinity Water	WRE region*	
					RdWRMP24	RdWRMP24	RdWRMP24	RdWRMP24	Draft plan	Final plan
Environmental Improvement Plan targets	Distribution input per capita*	2019/20	Baseline	Potable water supplied (l/p/d)	243.9	230.2	260.5	197.2	not reported	239.9
		2026/27	-9%	% reduction from baseline	-8.6%	-7.4%	-10.6%	-17.2%		-8.6%
		2031/32	-14%		-13.3%	-14.0%	-16.9%	-18.2%		-14.2%
		2037/38	-20%		-18.4%	-19.5%	-20.9%	-24.7%		-19.1%
	Per capita consumption*	2024/25	Baseline	Litres per person per day (l/p/d)	134.4	153.1	132.5	115.7	135.5	139.3
		2037/38	122 l/p/d		118.1	123.6	115.7	108.4	not reported	119.6
		2049/50	110 l/p/d		109.7	110.3	106.9	92.1	110.0	109.5
	Non household demand	2019/20	Baseline	Value Ml/d	286.0	73.0	22.5	170.5	not reported	398.8
		2037/38	-9%	% reduction from baseline (absolute)	-0.1%	19.5%	37.7%	-6.6%		2.7%
				% reduction from baseline (relative to growth)	-8.5%	-9.0%	-11.5%	-13.6%		-9.0%
		2049/50	-15%	% reduction from baseline (absolute)	-0.7%	19.7%	43.4%	-2.2%		2.7%
				% reduction from baseline (relative to growth)	-15.0%	No commitment beyond 2037/38	-11.0%	-15.0%		-13.2%
	Leakage	2017/18	Baseline	Value Ml/d	191.3	66.9	14.6	178.7	not reported	276.8
		2024/25	-16%	% reduction from baseline	-14.2%	-19.6%	-9.6%	-17.0%		-15.3%
		2026/27	-20%		-16.8%	-21.2%	-16.2%	-24.0%		-18.1%
		2031/32	-30%		-22.3%	-25.3%	-30.7%	-		-23.9%
		2037/38	-37%		-29.0%	-30.2%	-45.1%	-40.0%		-30.4%
		2049/50	-50%		-38.1%	-40.0%	-50.0%	-40.0%		-39.3%
Demand management activity	Metering penetration	2025	n/a	% completed	85.5%	67.2%	76.4%	80.3%	84.0%	80.0%
		2050	n/a	% completed	93.0%	84.1%	98.5%	91.6%	97.0%	91.0%
	Smart metering rollout	n/a	n/a	Full rollout (year)	2030	2035	2035	2040	2040	2040

To note: Based on revised draft WRMP24 (rdWRMP24) Dry Year Annual Average (DYAA) final plan data (demand management options included)

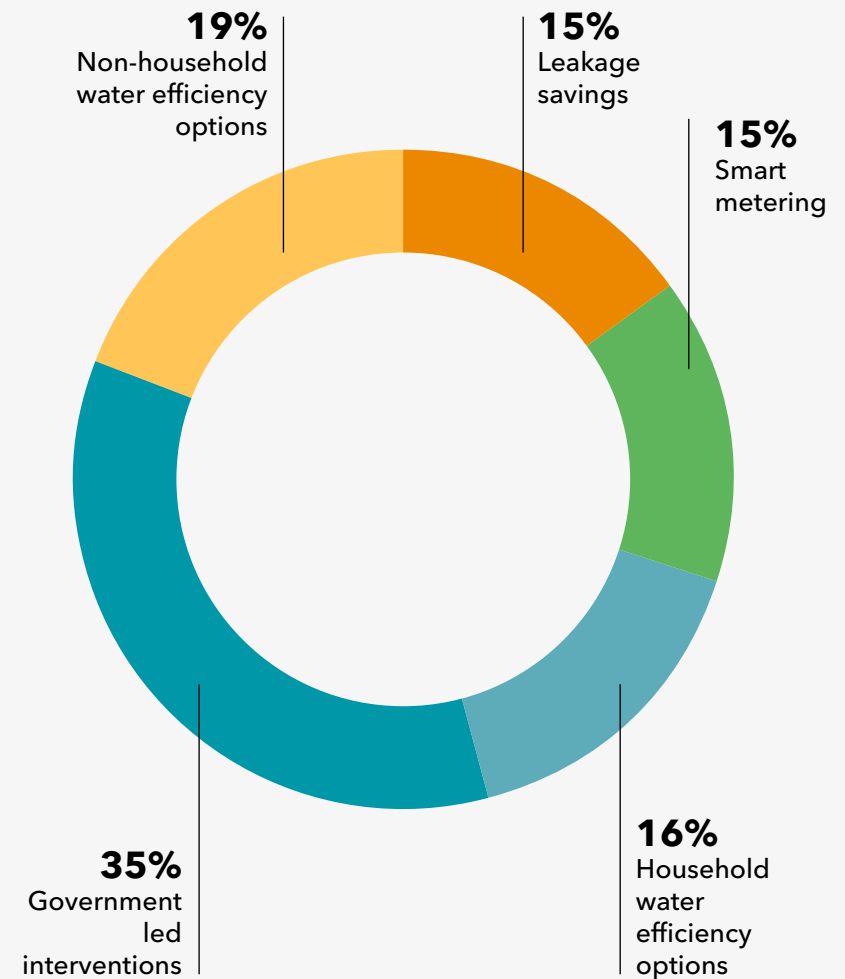
\* WRE regional totals apportioned by contribution of water company. Brett WRZ only for Affinity Water. Does not include Hartlepool WRZ for Anglian Water

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**Regional distribution input per capita is set to fall by 19% by 2038 versus the 2019/20 baseline, closely mirroring the statutory national water saving target.** This is due to a programme of demand management activity by the four water companies backed by supportive policy from government, even if savings on leakage and non-household consumption are in isolation falling short of national expectations. Overall, demand management activity is expected to reduce the projected public water supply demand deficit by 333 Ml/d by 2050. Included in this is the assumption that new government policy will reduce consumption by approximately 11-14 l/p/d. This equates to 35% of total demand management activity across the region. A full breakdown of the demand management components is presented in Figure 5.6.

- **Household per capita consumption (PCC):** PCC is forecasted to reduce from 135 l/p/d in 2025 to 110 l/p/d in 2050. Both leakage performance and driving down household consumption will be supported by high levels of metering penetration, smart metering programmes, and the start of compulsory metering in some areas. Whilst there is only one interim PCC target, for 2038, due to the delivery risk associated with these savings both water companies and WRE will regularly track PCC performance and report on progress annually.
- **Non-household consumption:** The government's Plan for Water includes a national target to reduce non-household demand by 9% in 2038 and 15% by 2050. WRE is working to unlock the significant untapped potential to reduce non-household water consumption by encouraging joint work between wholesalers and water retailers including to instal smart meters, and to press the government for supportive policies (see Section 7). However, achieving an absolute reduction of 9% consumption versus the national target's 2019/20 baseline will be extremely challenging due to the high projections of growth in the region. The only way to achieve this would be to refuse to supply new water-intensive non-household development – a perverse outcome putting regional economic growth at risk. WRE's water company members therefore propose to offset the projected increase in non-household consumption by 9% in 2038. Whilst this represents a 3% increase against the 2019/20 baseline, it is a pragmatic way to balance NHH consumption with growth within the region.

Figure 5.6: Components of regional demand management strategy





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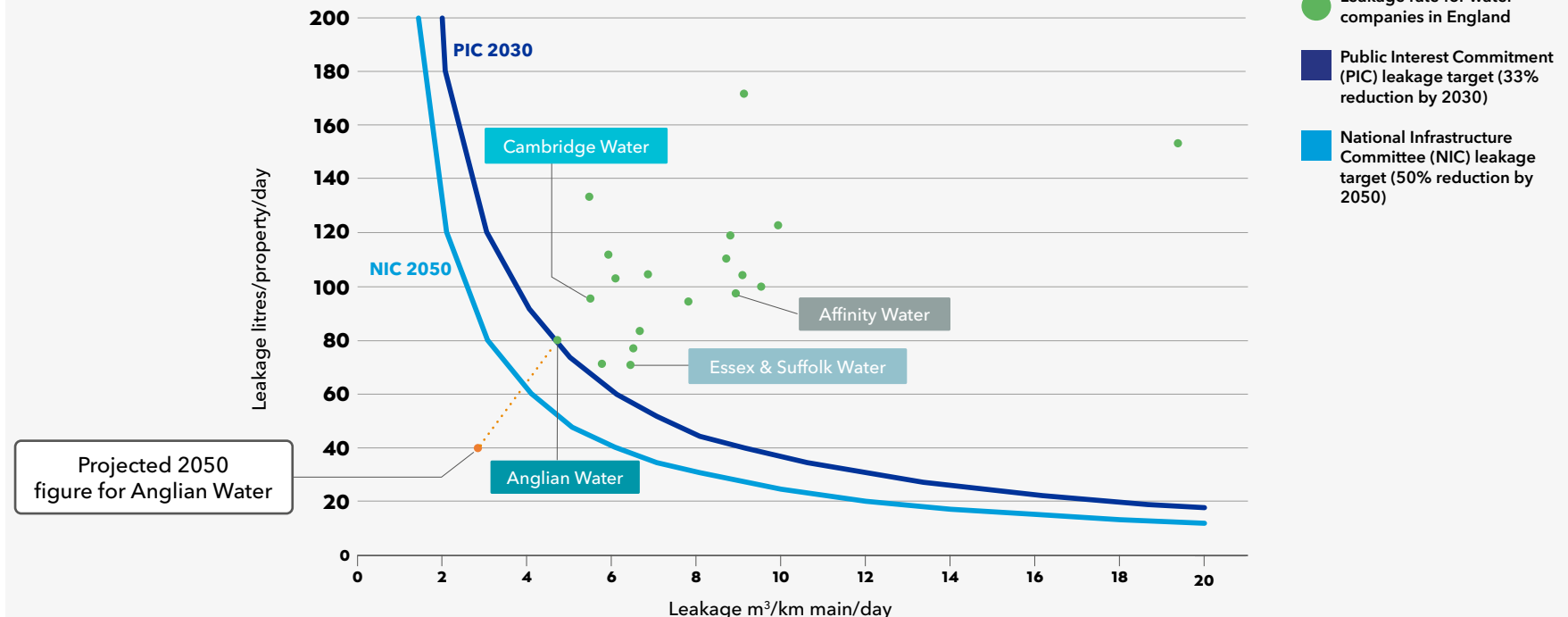


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- Leakage:** WRE's four water companies have reconsidered their leakage strategies since the draft plan stage and now propose to reduce leakage by a combined 39% by 2050 (up from 29% at the draft plan stage). Our member companies are already industry-leading on leakage with far less potential than elsewhere in the country to cost-effectively reduce their leakage any further. Committing to go further at this stage could lock Anglian Water in particular into disproportionate costs and bill impacts. The ambition to halve leakage is a national target, which would be achieved if other regions are able to match the WRE companies' projected leakage performance in 2050 (See Figure 5.7).

- Drought measures:** Water companies are able to seek Temporary Use Bans (TUBs) for households and Non-Essential Usage Bans (NEUBs) for non-household customers during extended dry spells to help manage demand. Water companies in the WRE region are not planning to rely more frequently on these activities. In the long term, the water savings from such measures is projected to decline as usage itself decreases.
- 'Accelerated Infrastructure Delivery' (AID) scheme:** As well as money for supply-side schemes, Ofwat approved additional funds in June 2023 to accelerate the installation of smart meters (see Box on page 45). For example, Anglian Water will instal an extra 60,000 meters before 2025 to save an additional 0.9 Ml/d.

Figure 5.7: Current leakage performance for 2022/23 by WRE water companies



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## New supply-side measures

Significant investment will be needed by all sectors in new sources of water supply to deliver greater resilience to drought in the changing climate, and to leave more water in the environment for nature.

We support the view presented in the National Framework that new supply-side and water transfer infrastructure will be required even with the most ambitious demand management strategies.

**Our options identification and development process has ensured that a diverse portfolio of supply options has been explored.** Following feedback on our Emerging Regional Plan, we relaxed the 10 MI/d threshold for including options in our modelling to make sure we have not artificially constrained the search process.

- In total, we have identified a long list of feasible supply-side options totalling c. 1,500 MI/d from which to derive our best value plan. This is more than three times larger than the projected regional supply-side deficit, even having excluded different size variants of the same scheme, and option combinations that are not feasible due to environmental or other limitations. Increasing the long list of options beyond this has proven difficult as our region is extremely water stressed with unique geographical and environmental constraints.
- We have included options such as desalination in the longer term as there are limited alternative options available within the planning horizon. Desalination also offers the potential for more flexibility (including scalability) in adapting to future uncertainties.
- These large-scale options are supported by demand management options and smaller scale, short term options such as within-region transfers and creation of new treatment works, to maximise existing resources and provide the necessary infrastructure for water to be moved to where it's needed.

Through our modelling work for the final plan, we have refined our portfolio of options to reflect new information, such as considering alternative reservoir sizes for the Lincolnshire and Fens reservoirs and updated environmental assessments.

**Our final Regional Plan is built upon a series of 'low regret' options; those which make sense to pursue under almost any future climate, demand, and environmental scenario.** We have also considered how long each supply option would take to implement, so that we can plan for them coming into supply when needed to address the emerging deficits. As major new water infrastructure can take years if not more than a decade to deliver, a whole series of investments need to be taken forward now.

**At the core of our Regional Plan are two Strategic Resource Options (SROs) that are being promoted through the Regulators' Alliance for Progressing Infrastructure Development (RAPID) gated process: the Lincolnshire Reservoir and the Fens Reservoir.** Both schemes were granted further development funding in full by RAPID at the last checkpoint (Gate 2 in June 2023) in order to be worked up to the next level of detail to reach Gate 3 by September 2024. WRE is working to ensure that these schemes are designed with multi-sector beneficiaries in mind. Alternative reservoir options such as to increase the volume of existing reservoir systems through dredging or raising dam walls have been rejected as unfeasible. A further strategic option to transfer water from Anglian Water to Affinity Water has now been discounted by both companies and so has not been included in our final plan.

- **The Fens Reservoir:** this reservoir with storage of 50 million cubic meters occupying 5km<sup>2</sup> of the Cambridgeshire Fens is currently projected to supply Anglian Water and Cambridge Water with 88.8 MI/d, split equally between them, with the potential for this yield to be increased further. The preferred site and other design aspects were the subject of [public consultation](#) in late 2022, and the first round of statutory public consultation is expected in spring 2024. Our models select the Fens Reservoir to enter supply as soon as it is available, likely to be between 2035 and 2037. This additional storage will allow abstraction to reduce at existing sites and help achieve long-term Environmental Destination improvements. The potential increases in yield, possible due to a different combination of supply sources facilitated by the Middle Level Commissioner's drainage system, would help further improve the relative cost-effectiveness of the Fens Reservoir option which is already more attractive than alternatives such as earlier and more desalination.



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- **The Lincolnshire Reservoir:** the location and design features of this reservoir were also the subject of [public consultation](#) in autumn 2022 with a formal statutory consultation process due in spring 2024. Similar in size to the Fens Reservoir but with a higher expected yield of 169 Ml/d, the Lincolnshire Reservoir is also selected as soon as it becomes available. The scheme is currently scheduled to enter supply between 2039 and 2041 and will help achieve both the 1:500 standard of supply resilience and contribute toward Environmental Destination requirements. The yield of the Lincolnshire Reservoir is higher than the Fens due to higher availability of water to abstract during the winter, backed by what amounts to a new inter-regional transfer from Water Resources West, from the River Trent to the Lower Witham.
- **The Anglian to Affinity Transfer:** this option to transfer water from the new Lincolnshire Reservoir to the Affinity supply area (within the WRSE region) has now been discounted with RAPID's approval at the Gate 2 stage. Affinity Water and the WRSE region more generally has more cost-effective supply options available, including by sourcing water from Water Resources West via the Grand Union Canal. However, the scheme will still be taken forward as a shorter within-region pipeline to move water sourced from the Lincolnshire Reservoir from Peterborough to Grafham Water (hence now called the Peterborough to Grafham Strategic Transfer (P2G)).



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## How we have selected our portfolio of 'low regret' options

The regional simulator allows us to test combinations of feasible options and operating regimes over a wide range of potential scenarios for 2050, reflecting uncertainty in demand forecasts, climate change, weather patterns and also the different Environmental Destination scenarios.

The simulator iteratively tries out (through over one hundred thousand runs) different combinations of options to maximise system performance (see Figure 5.2 on page 44).

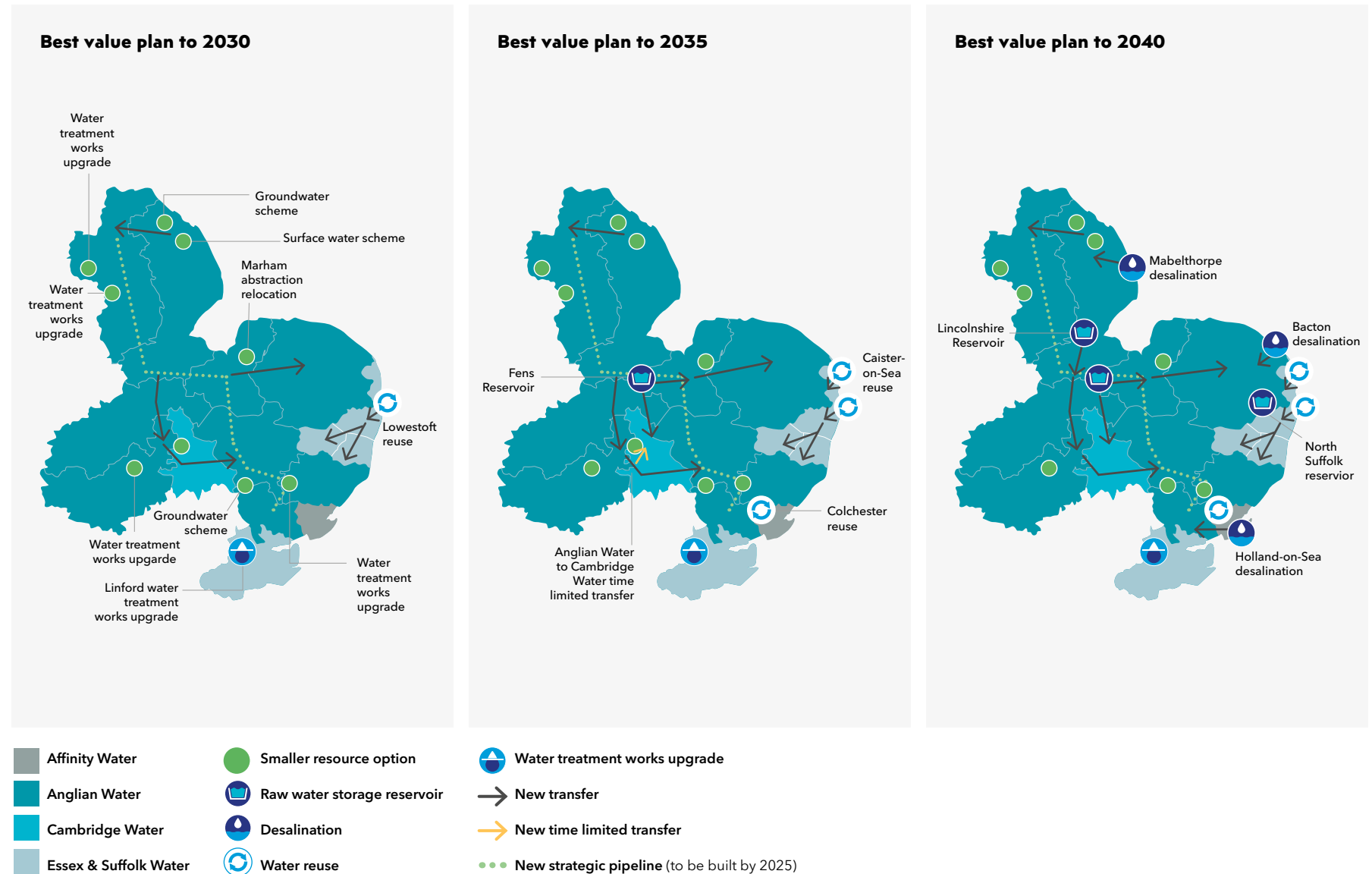
**This process reveals trade-offs. It is not possible to deliver the optimum water supply outcome for all sectors in all catchments and deliver all environmental targets simultaneously at minimum cost.** So, WRE's multi-sector Technical Delivery Group identified acceptable performance levels for each metric, bringing in the ability for levels of compromise to be tested. For example, increasing acceptable costs to allow greater environmental performance. Portfolios of options that allow the system to perform within these acceptable ranges are considered 'good performing' portfolios.

**By looking across all of these good performing portfolios we can see how often each supply option forms part of a plan, for each Environmental Destination scenario.** Some options appear in every or almost every portfolio for each Environmental Destination scenario. These include the Fens and Lincolnshire Reservoirs. Some are common between scenarios, meaning that it is highly likely that the option will be needed irrespective of the outcome of further environmental investigations through the WINEP process. This is why such options are called 'low regret'. Some options appear a little less frequently (60- 90% of the time) within a particular Environmental Destination scenario, or are activated in only two of the three Environmental Destination scenarios.

**By continuing to develop these options early in the planning period until uncertainty in future scenarios and environmental needs reduces, we retain flexibility in which scenario emerges through time and the make-up of portfolios of options.** Being able to explore long term uncertainty and identify options that should be kept in play as part of an adaptive process through time is one of the key benefits of regional planning. This has helped to build a strong case for the continued development of the two strategic reservoir options in the region, by demonstrating that they form a key part of a long-term plan for water resources and environmental improvement within the region, that is robust to a range of potential future choices and challenges. Note that the final size, yield and operation of the reservoirs is the responsibility of the water company scheme promoters - Anglian Water for the Lincolnshire Reservoir, and Anglian Water and Cambridge Water for the Fens Reservoir - informed by WRE's regional-scale models.

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Figure 5.8: Key milestones toward our best value plan in 2050



## The Lincolnshire Reservoir

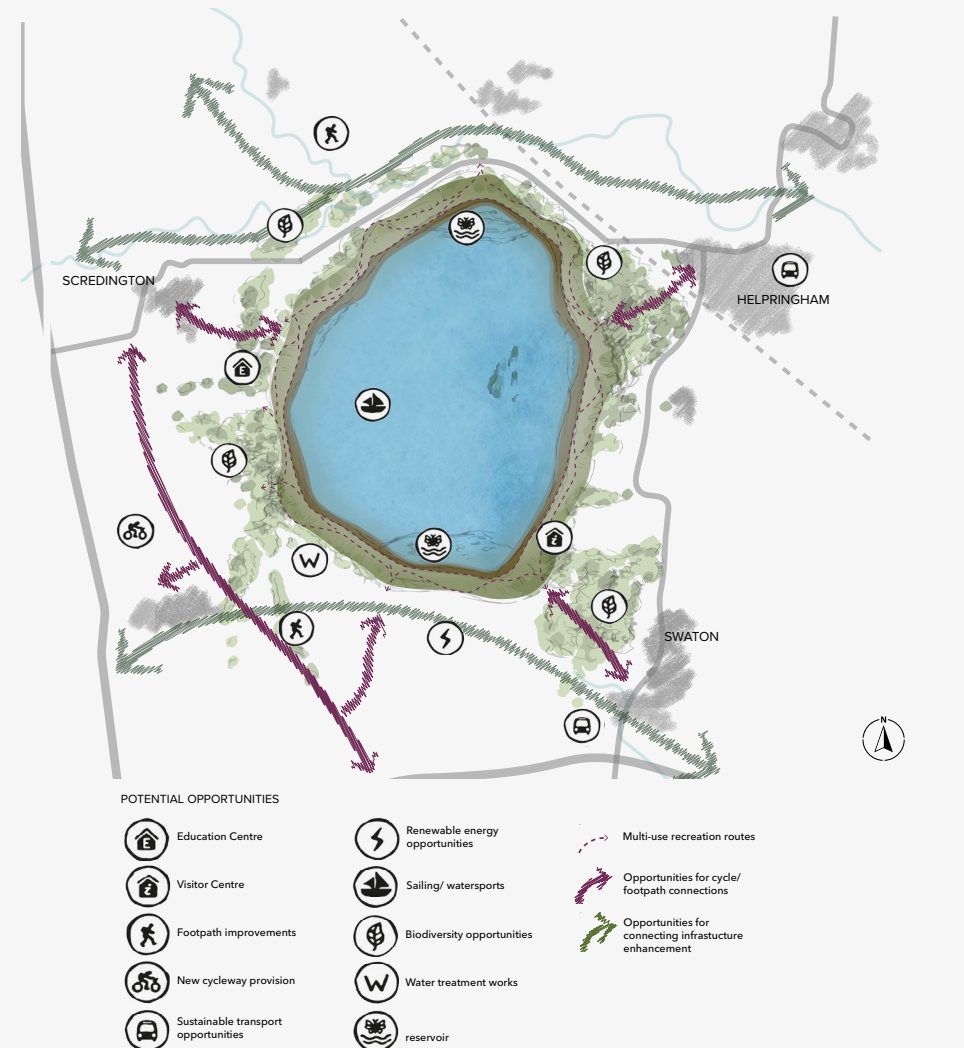
**The preferred site for the Lincolnshire Reservoir is south of Sleaford between the villages of Scredington, Helpringham and Swaton.**

The new embanked reservoir is designed to be 55 million m<sup>3</sup> (with a usable volume of 50 million m<sup>3</sup>), a water surface area of approximately 5km<sup>2</sup>, and able to supply c.500,000 households. An abstraction point on the River Witham would provide up to 400 ML/d when flows allow, supported by a 300 ML/d transfer from the River Trent. The estimated cost of the reservoir is £2.33 billion.

**As a Nationally Significant Infrastructure Project (NSIP), the Lincolnshire Reservoir will require a Development Consent Order (DCO), and as such must comply with the requirements and guidance associated with the Planning Act 2008. The DCO application will be submitted in 2025 which should allow a construction start date of 2029.** The construction and commissioning programme is expected to take ten years which would enable the Lincolnshire Reservoir to enter supply from 2039. The first public consultation exercise commenced in October 2022 and ran for ten weeks, with a [summary of the feedback](#) published in March 2023. Two further rounds of statutory public consultation will follow in 2024 and 2025.

**There is an opportunity for the Lincolnshire Reservoir to be part of a much bigger system, enabling wider multi-sector benefits across the area. This work is being championed by the South Lincs Water Partnership chaired by WRE.** An initial system concept for the reservoir and surrounding area has been developed with stakeholders, illustrating the potential to deliver social, environmental, and economic value beyond that achievable by the reservoir project alone. This includes benefits for agriculture, navigation, flood protection, amenity and recreation, and biodiversity and habitat creation. WRE has been working with the Water Farming Reservoir Group; formed to explore benefits for agriculture from both of the strategic reservoir options in our plan.

Figure 5.9: Proposed reservoir in Lincolnshire: indicative community and environmental opportunities for consultation





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## The Fens Reservoir

**The preferred site for the Fens Reservoir is located east of the A141, between the town of Chatteris in the south and the village of Doddington in the north.** The new embanked reservoir is designed to be 55 million m<sup>3</sup> with a useable volume of 50 million m<sup>3</sup> and a water surface area of approximately 5km<sup>2</sup>, supplying c.250,000 households. The water will be abstracted from several different sources including the River Great Ouse and the River Delph when river levels allow. The estimated cost of the reservoir is £1.96 billion.

**The project follows the same long-term programme as the Lincolnshire Reservoir with efficiencies on offer by delivering two DCOs in parallel.** However, the earthworks programme for the Fens Reservoir is shorter than for the Lincolnshire Reservoir, and therefore starting construction in 2029 would enable the Fens Reservoir to enter supply between 2035 and 2037. A ten-week non-statutory public consultation commenced in October 2022 with a [summary of the feedback](#) published in March 2023. Two further rounds of statutory public consultation will follow in 2024 and 2025.

**As with the Lincolnshire Reservoir, there are significant multi-sector benefits that could be unlocked by the Fens Reservoir.** These are being championed by the Fens Water Partnership that is also chaired by WRE. Potential benefits include water for agriculture, new habitats and nature connectivity, benefits in terms of amenity, recreation and the historic environment, and flood protection and water level management.

Figure 5.10: Proposed Fens Reservoir: indicative community and environmental opportunities for consultation



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## Water reuse

**Water reuse (or effluent reuse) is the process of recycling effluent from water recycling centres for reuse in the public water supply.** This can either involve a direct transfer of effluent to a reservoir, or discharge to the environment and then re-abstraction downstream. Either way, the treated effluent will already be of better water quality than that typically abstracted from rivers and waterbodies, before being treated further to meet strict drinking water quality standards. Water reuse has not been favoured in the past because of customer preferences for other raw water sources.

**A number of water recycling centres have been assessed for their potential as water reuse schemes based on volumes of treated effluent available.** But another important consideration is whether the effluent is needed to augment river flows downstream. The Environment Agency's Catchment Abstraction Management Strategy (CAMS) report identifies particularly stressed watercourses that would not be suitable for water reuse if effluent is needed to preserve ecological health.

**Water reuse schemes are proposed as part of our final Regional Plan at Colchester in Essex and Lowestoft in Suffolk.** Smaller water reuse schemes can also displace consumption of potable and non-potable water by water-intensive industrial and amenity sites, and agriculture. For example, in the leisure sector there is the potential for treated effluent to be used to irrigate golf courses, thereby reducing their need to draw upon the public water supply. WRE's Drought Group has been exploring the potential for small scale water-reuse schemes to provide greater supply resilience to agriculture.

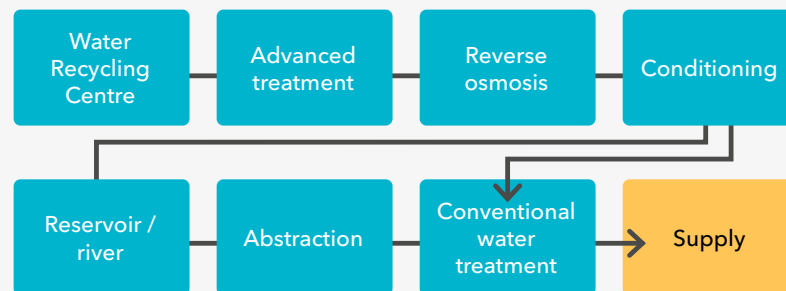
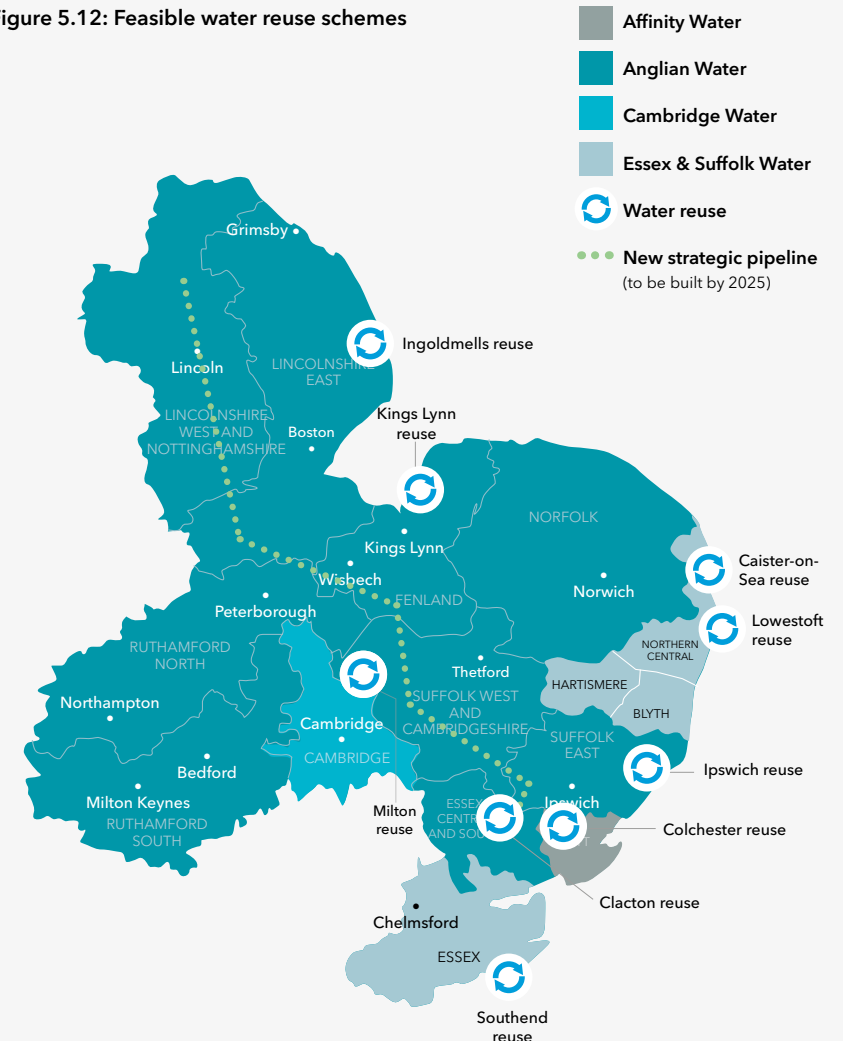


Figure 5.11: Typical water reuse treatment process

Figure 5.12: Feasible water reuse schemes



## Desalination

**Desalination has been assessed to be a viable option to provide additional water for the east of England. These options are needed later in the planning period.** This allows time for the carbon intensity of the energy grid to reduce and improvements made to reduce the technology's carbon and environmental impacts. A key aspect of this will be to find an environmentally-safe means to recycle or dispose of the brine water residue created by the desalination process. Further advancement of these technologies will need to be achieved before desalination plants can be commissioned as part of WRE's Regional Plan. While these form vital strategic water resources options, desalination capacity does not appear in our core plan until the 2040s.

**A high-level spatial screening of the east coast of England has been carried out to identify possible viable locations for desalination.** 500km of coastline including estuaries was evaluated in this process. Three alternative types of desalination were identified:

- Coastal: onshore desalination plant with intake and outfall to sea.
- Estuarial (brackish): desalination plant located in an estuary with intake and outfall to the estuary system.
- Floating: desalination plant located on a barge, moored offshore with desalinated water then piped onshore.

Further detailed assessment and fine level screening of the different types of desalination, supported by workshops held with stakeholders, led to both floating and brackish options being discounted. However these could be revisited if further desalination options are required in the future.

**Three coastal desalination plants are proposed in the plan from 2040, sited in the areas of Mablethorpe in Lincolnshire, Bacton in Norfolk and Holland-on-Sea in Essex.** Our draft plan also included a scheme at Felixstowe in Suffolk, and a project at Caister-on-Sea rather than Bacton. Bacton is now preferred to Caister due the potential benefits of co-location with energy infrastructure and other local factors. Felixstowe has been displaced from our core plan by more action instead on leakage reduction.

Figure 5.13: Feasible coastal desalination options



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## Use of drought measures

Planning for long-term water resources requirements and planning for drought are two separate but closely-related processes.

Water Resource Management Plans ensure there are sufficient water supplies available over the long-term and that droughts up to a certain severity can be managed. Drought Plans define the steps required in the short term in response to extended periods of dry weather, including in drought conditions that may be beyond those planned for in WRMPs.

### Types of drought

Droughts occur when a period of low rainfall and high evaporation and demand creates a shortage of water. They reduce water supplies to different users, depending on where and when the lack of rainfall occurs and how reliant they are on specific sources of water. Our region is at high risk of drought due to already low average annual rainfall. The Environment Agency define three types of drought:

- **Environmental drought:** low rainfall causing reduced river flows, exceptionally low groundwater levels and insufficient moisture within soils. These conditions often result in signs of stress for wildlife, fish and habitats.
- **Agricultural drought:** low rainfall and reduced moisture in soils to support crop production or farming practices such as spray irrigation. Irrigation may also be constrained by environmental limits on abstraction licences or statutory restrictions.
- **Water supply drought:** low rainfall coinciding with potentially heightened demand during hot weather causing water companies concern about supplies for their customers. Water supply droughts tend to take longer to develop than environmental or agricultural drought because water companies have invested over successive investment cycles in additional water storage and transfer schemes which provide greater resilience to extended dry periods.

The extended period of dry weather in 2022 led to an environmental drought being declared in parts of Eastern England and severe water shortages for some farmers as abstraction was curtailed. But due to past investment in resilience by our member water companies it did not result in a water supply drought, and thresholds in water company drought plans that could have resulted in temporary and non-essential use bans were not met.

**By helping abstractors plan for their long-term water resource needs, this Regional Plan helps to increase the region's resilience to drought, reducing the chance of expensive, reactive or environmentally-damaging measures being required in the future.** Drought planning needs to take place at several levels, from national government to local abstractor groups and individual licence holders.

- **Environment Agency drought plan:** This national framework outlines how drought affects England and how the Environment Agency works with government, water companies and others to manage the effects on people, business, and the environment. It aims to ensure consistency in the way the EA co-ordinates drought management across England.
- **Water company drought plans:** Like company Water Resources Management Plans, Drought Plans are statutory documents updated every five years, subject to public consultation, and approved by the Secretary of State. They set out the steps that water companies will take should extended dry weather and drought - often coinciding with elevated household demand - cause acute pressures on potable water supplies. Each type of action has a Level of Service (LoS) agreed with the Secretary of State, which defines the annual likelihood of measures being needed (see Table 5.2).
- **Regional drought plans:** Regional groups have no formal role in drought planning under the current National Framework for Water Resources. However our new WRE Drought Group is working across sectors to join up drought related communications and activities. To support this, we are also exploring water sharing options to alleviate impacts of dry weather restrictions on abstraction. These options may form part of future sectoral drought and water resource plans.
- **Agricultural drought plans:** Alongside their work on an Agri-Food WRMP framework, the Water for Food Group has commissioned an Agri-Food Drought Plan framework. This will guide short-term tactical documents being produced by farmers and farm clusters to outline drought triggers and response options. The framework will be consistent with Environment Agency and water company drought plans to help coordinate cross-sector management of drought conditions.



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### Our water company members have considered but rejected the option of increasing their reliance on drought measures to manage scarce water resources.

This is a good outcome for water company customers, businesses and the environment in the region. It means Temporary Usage Bans (TUBs), Non-Essential Usage Bans (NEUBs) and drought permits that could compromise environmental safeguards will become no more likely than at present. This is despite water companies needing to step back significantly over time from their current sources of abstraction.

- TUBs are just one of many demand management actions a water company can take during a drought. First they will increase public communication about the potential for water shortages and encourage customers to use as little as possible (Level 1 measures), before Temporary Usage Bans (Level 2) and Non-Essential Usage Bans (Level 3) are introduced.
- TUBs and NEUBs are a formal part of drought plans developed by each water company. TUBs impose restrictions on the use of domestic hosepipes, jet washers and sprinklers as well as domestic swimming pools and jacuzzis to help manage demand and protect the environment during drought conditions. NEUBs impose similar restrictions on non-household users of the public water supply.
- The most severe restrictions are Level 4 measures, involving supplies to households being restricted at certain times of day (rota cuts) or even cut off altogether and water being supplied by standpipes and bowers in the street. Water companies can also apply for drought permits and orders that allow them to temporarily override abstraction restrictions. As these activities put additional pressure on the environment all such requests must be approved by the Environment Agency.

Level of Service (LoS)	Affinity Water	Anglian Water	Cambridge Water	Essex & Suffolk Water
Level 1: Appeal for restraint / enhanced communications	Not specified	Not specified	Not specified	10% average annual risk
Level 2: TUBs	10% average annual risk	10% average annual risk	5% average annual risk	5% average annual risk
Level 3: NEUBs	2.5% average annual risk	2.5% average annual risk	2% average annual risk	2% average annual risk
Level 4: emergency drought order e.g. standpipes or rota cuts	Only for short duration, localised emergencies	<0.2% average annual risk	1% average annual risk	0.4% average annual risk

Table 5.2: Annual chance of drought response measures being needed, as outlined in the respective water companies' published Drought Plans

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## Costs and benefits of our plan

The estimated total cost of supply-side options in our plan to 2050 is **£9.5 billion (undiscounted, in 2022/23 prices)**, with the majority of the capital investment taking place in the 2030s.

These costs are subject to review and highly likely to change as projects are developed in more detail. As the options in our plan predominantly serve the public water supply, we assume all of these costs will be financed through water company business plans and ultimately be funded by water bill-paying household and non-household customers. This means that the economic regulator, Ofwat, will ensure value for money is achieved in each case.

**In addition, the demand management options in our plan have an estimated cost of approximately £5.5 billion.** These costs are dominated by the need for large-scale mains replacement in the 2030s and 2040s across the Anglian Water region in order to achieve the heightened leakage performance expected by regulators. This mains replacement programme alone is estimated to cost around £4 billion (undiscounted, in 2022/23 prices).

**Figure 5.14 sets out the estimated costs of building and operating the new supply-side schemes needed through the planning period, after demand management and leakage interventions are taken into account.** The grey line represents our core pathway, delivering the scale of abstraction reductions set out in the Resilience (BAU+) Environmental Destination scenario by 2040. How these new supply options build additional capacity through time is shown in figure 5.15.

- New supply options developed in the early part of the planning period are needed to meet population growth and increases in non-household demand.
- By the mid-2030s investment in new supplies also offsets reduced water availability resulting from statutory licence caps, preventing deterioration in the environment.
- By 2040 water companies in the region will have also built resilience to more severe droughts to meet the 1:500 drought resilience standard.

Figure 5.14 also shows how the costs of the plan would alter if an alternative pathway was taken in future, whether by choice on the scale of abstraction reduction sought by 2040, or as a consequence of future consumption being higher than expected.

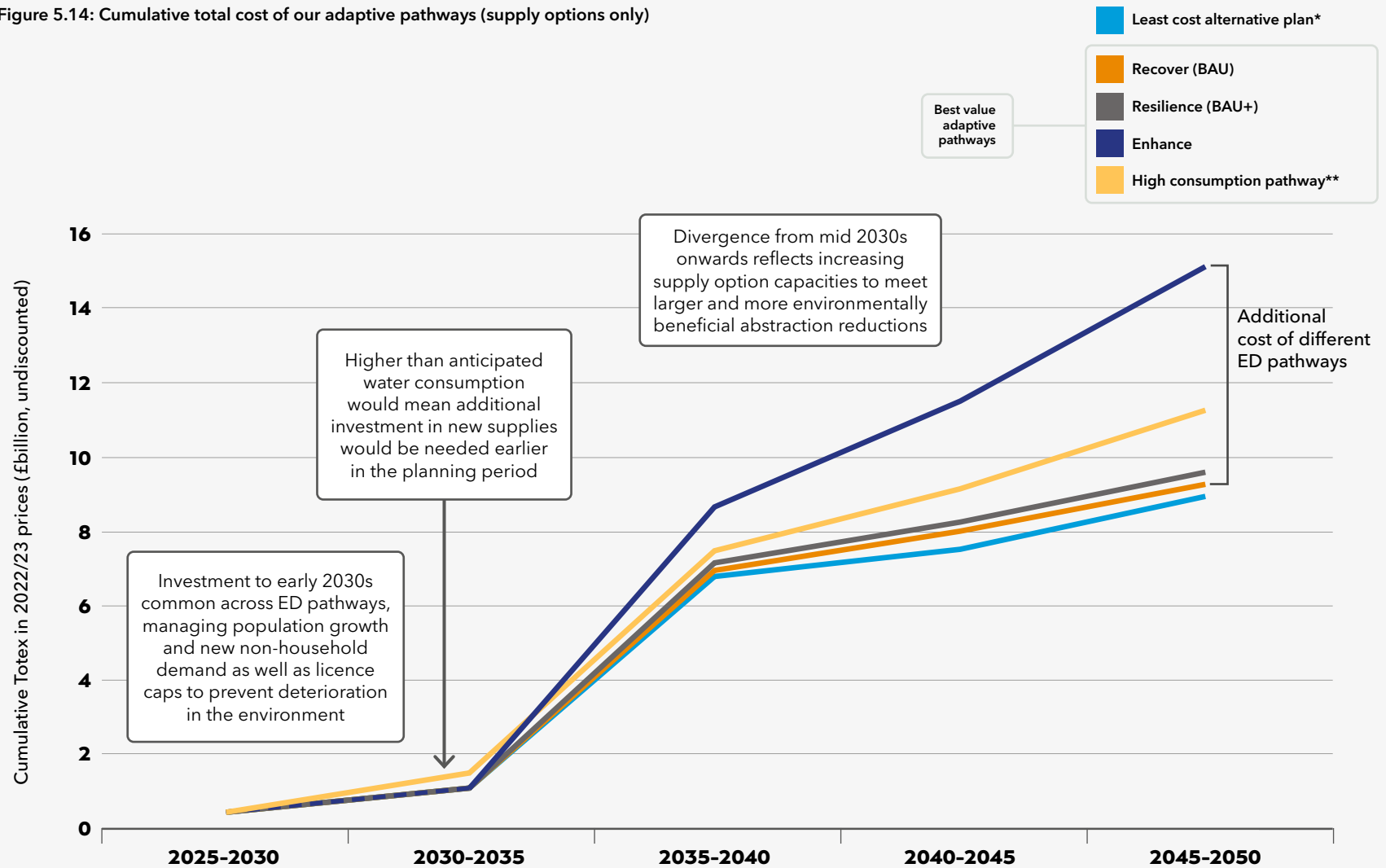
**Our Integrated Environmental Assessment (IEA) supports our preference for focusing attention on demand management and reservoir storage in the short to medium term. This allows development of new desalination options to be deferred.** This gives time for the electricity grid to decarbonise and the water industry to make progress toward their net zero target for 2030. It also allows time to develop appropriate mitigation for the environmental impacts of constructing and operating these large schemes. It is important to note that while new supply options may have unavoidable environmental consequences that will need mitigation, the key driver for these schemes is to alleviate pressure from sensitive water-dependent freshwater environments such as chalk streams and wetlands. How we have considered such trade-offs in environmental costs and benefits is discussed in more detail at Annex 2.

**The choice of long-term Environmental Destination is the major determinant of costs and the cost profile within our plan.** For example, achieving the 'Enhance' Environmental Destination based on current expectations adds a further £5.4 billion of costs to our plan by 2050. This is due to the need for earlier and larger desalination schemes to provide the extra supply capacity required. However, this estimate could fall once the proposed Environmental Destination investigations beginning in 2024 identify the necessary abstraction reductions with more confidence. There is also the possibility of prioritising the achievement of environmental flow improvements in particular habitats where there is the potential for the greatest ecological gains. Our approach to retaining adaptability in our plan is described further in Section 6.

**A Cost Benefit Assessment (CBA) conducted to underpin our final plan highlights a range of potential economic impacts from reducing abstraction. It also suggests standard CBA methodologies fail to properly value environmental resilience.** Our cost benefit project has shown a need for a more holistic, natural capital assessment approach to valuing environment health and the interventions needed to achieve it. Current approaches appear to undervalue environmental improvement, which then results in beneficial measures being considered uneconomic and ruled out. This could in part explain why in the past the environmental consequences of economic development have been considered acceptable, where they have been considered at all, leading to the current poor state of waterbodies. A more comprehensive, holistic approach to assessing the costs and benefits can also be used to make more robust decisions by regulators on individual licences. It could also pave the way for greater use of nature-based solutions and complementary actions alongside abstraction reform to improve environmental flows and ecological health more generally.

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Figure 5.14: Cumulative total cost of our adaptive pathways (supply options only)



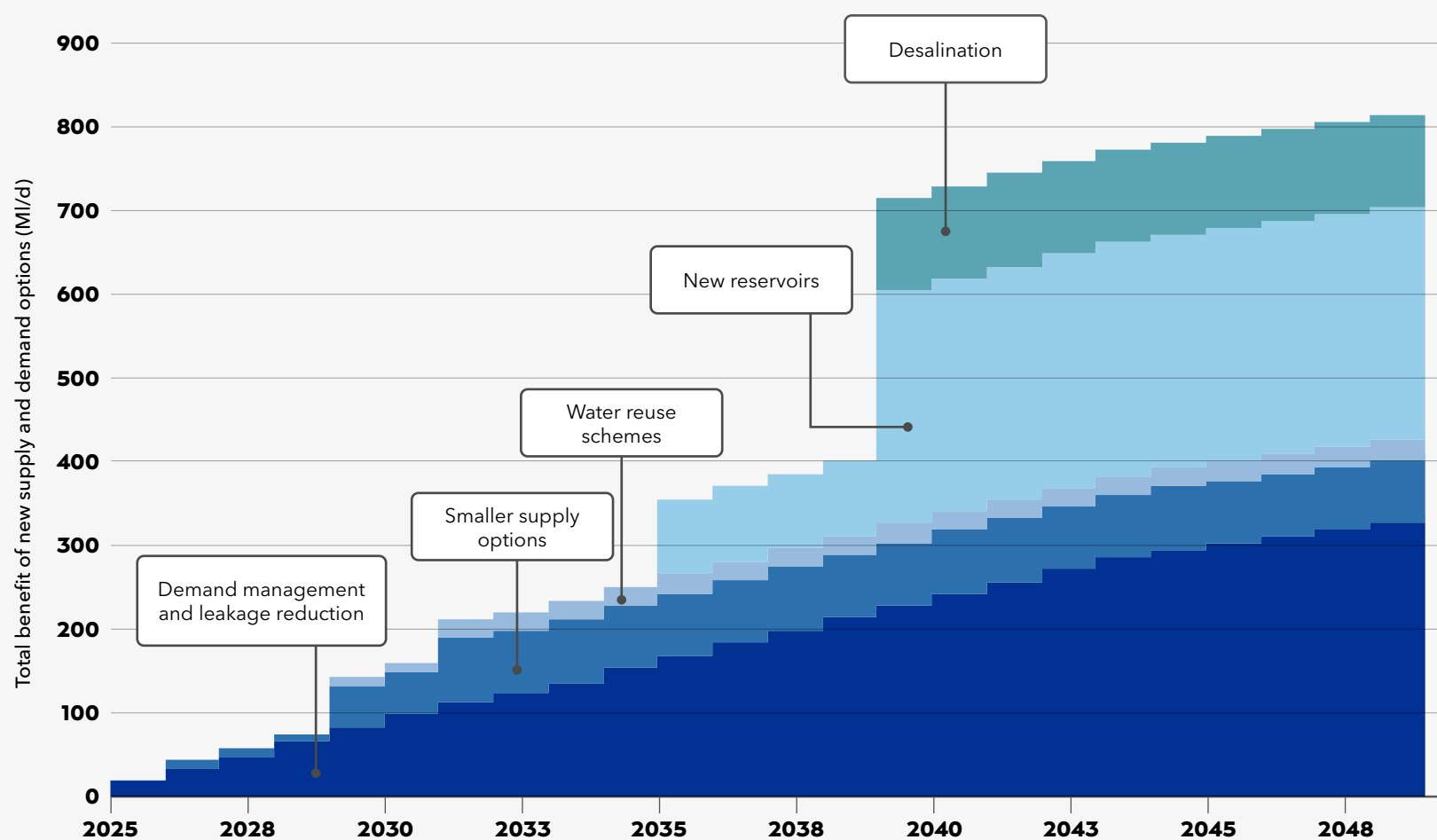
\*Least Cost alternative plan delivers the Resilience (BAU+) ED scenario and assumes water efficiency measures achieve the savings expected

\*\* Low water efficiency pathway assumes delivery of the Resilience (BAU+) ED scenario

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**Figure 5.15: Bridging the projected deficit over time**

Public water supply only under the 'Resilience' (BAU+) Environmental Destination scenario





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# RETAINING FLEXIBILITY IN OUR PLAN



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**Our plan looks 25 years ahead across the main water abstracting sectors. We can't know what the future holds and so our plan needs to be able to respond and adapt as key assumptions and circumstances change. We have carefully built our plan to allow us to do this.**

**We are confident that the core components of our plan that need decisions to be made at the start of the planning period represent 'low regret' options, that make sense to pursue under almost any future scenario.** We plan to revise and update our plan every five years in light of how key aspects unfold when compared to the assumptions we have taken at this stage.

The portfolio of 'low regret' options in our core pathway, as presented in Section 5, has been tested for its ability to be scaled up or down as we gain more certainty over the size of the emerging deficit through time. We have considered how the plan could adapt to a range of circumstances and decisions:

- **Environmental Destination:** this is the single most important factor driving our long-term plan for all sectors. Our plan and set of 'low regret' options allow the most ambitious environmental improvements to be delivered. But further exploration and local investigations need to take place to better understand the actual rather than assumed water needs of the environment in the various parts of each catchment, to inform how and when these improvements are best delivered.
- **Demand management:** we will track progress in reducing water use against key metrics for household and non-household consumption, and leakage control, including as a result of new government water efficiency policies in the pipeline. We will also track water use by other sectors to see how these compare to our projections. For example, switching land from food production to nature may reduce water needs but in other cases increase it significantly. New wetlands and lowland peat restoration projects promise huge gains in terms of water quality, carbon sequestration and flood management, but depending on local circumstances could also need more water to be found.

- **Climate change:** we will incorporate new climate projections data as and when they become available, in case key climate impacts such as changes to seasonal rainfall, temperatures and rates of sea-level rise accelerate further. There will also be secondary impacts of climate change that need to be monitored, such as higher temperatures and evapotranspiration rates increasing the need to irrigate crops, and driving higher peaks in household water demand during hot weather and heatwaves.
- **Regulatory and planning approval:** we assume that the options within our plan will be granted the funding and other approvals they need at each key stage in their development, including through the planning system. We will track the progress of key projects toward their delivery in case they begin to slip and alternative or interim options need to be brought forward.

**These influences acting alone and in combination will affect the size of the emerging deficit between supply and demand. At a regional level, we have modelled three adaptive pathways in addition to the core pathway, representing different scenarios of a growing deficit in public water supplies (see figure 6.1).** This modelling reveals when key branch points might occur. At these branch points, the size of the deficit could become smaller or larger than that in our core pathway and would therefore require an adjustment to investment in supply options.

Due to the long lead times of many supply options, investment decisions need to be made much earlier than the point at which the pathways could diverge. Our adaptive pathways therefore include both 'branch points' and the 'decision points' that precede them. Decision points occur earlier than the branch points in order to give time for alternative options to be developed.

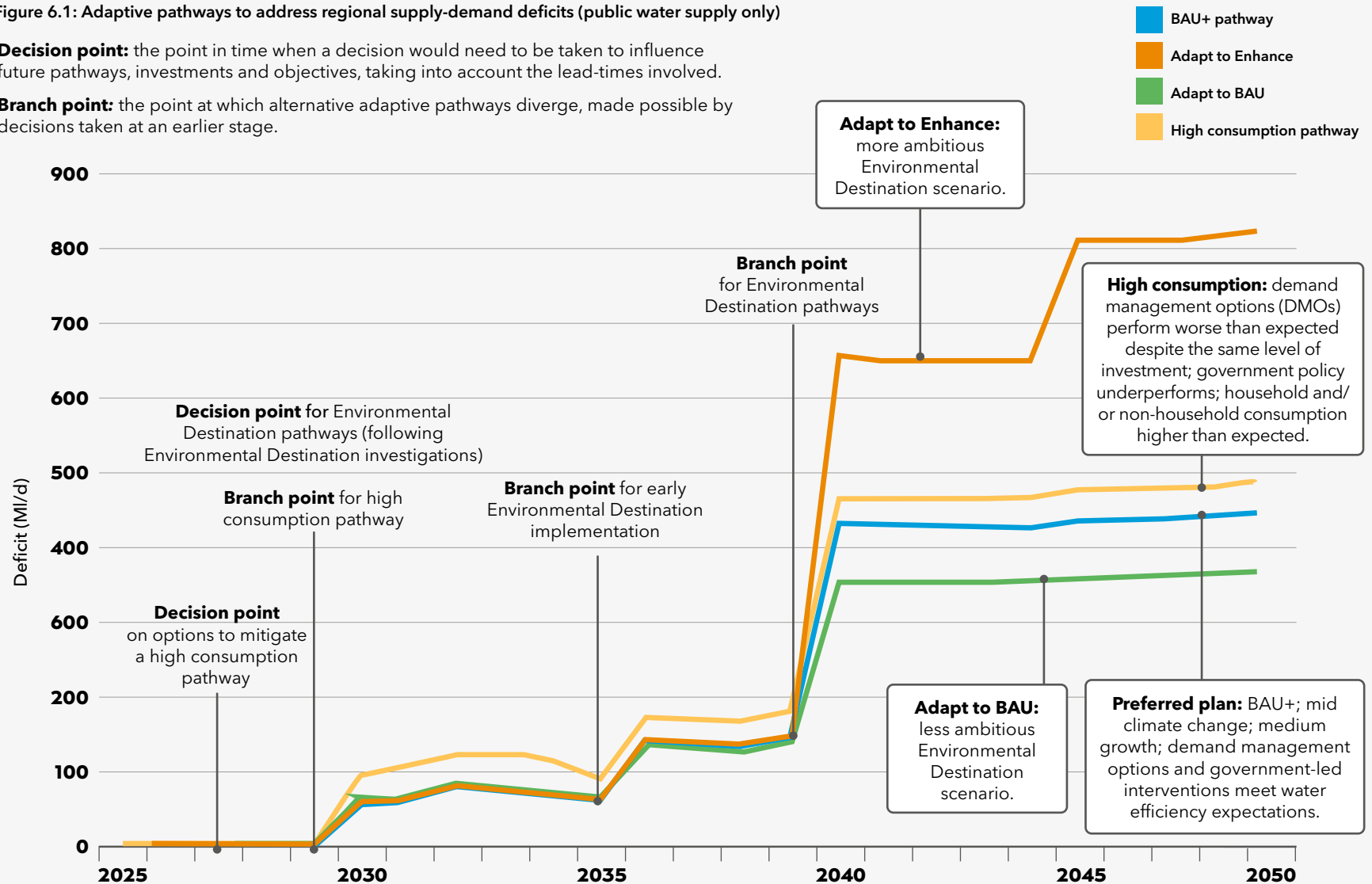
**Figure 6.1 illustrates how the scale of the public water supply deficit could differ from our core pathway, and indicates when decisions will need to be taken if future water needs look to be higher than our core pathway assumes.** These decisions will relate to both earlier investment in new supply options, and possibly decisions on postponing licence caps if new demand and supply options cannot be developed soon enough.

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Figure 6.1: Adaptive pathways to address regional supply-demand deficits (public water supply only)

**Decision point:** the point in time when a decision would need to be taken to influence future pathways, investments and objectives, taking into account the lead-times involved.

**Branch point:** the point at which alternative adaptive pathways diverge, made possible by decisions taken at an earlier stage.



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**Decisions on the long-term Environmental Destination and ‘high consumption’ pathways will be needed before 2030 so that the required options can be brought forward in a timely way.** These decisions can be informed by further evidence that WRE will gather with our water company members, regulators and multi-sector partners as part of the next round of regional planning:

- Data on actual demand, revised projections of future consumption including amongst non-household users, and the effectiveness of demand management and leakage control strategies.
- Whether supportive government policies are introduced as planned, how effective these appear to be, and as further plans and commitments are announced by ministers.
- The results of Environmental Destination investigations that establish firmer costs and benefits of adopting each pathway from 2040.

**If any of the previous factors call for additional water resources to be found, including to deliver ‘Enhance’-level flows within the environment, the shortfall will likely necessitate more desalination, and sooner, within our plan. There are no other scalable options in our region, as all sources of freshwater are at or near full utilisation if not already over-exploited.** More winter storage reservoirs may be possible in some areas, including smaller scale on-farm reservoirs for irrigation. But these will be limited by the volumes of water available even during the winter months to fill them. The alternative to more desalination would be to postpone the achievement of the key benefits of our plan, such as to:

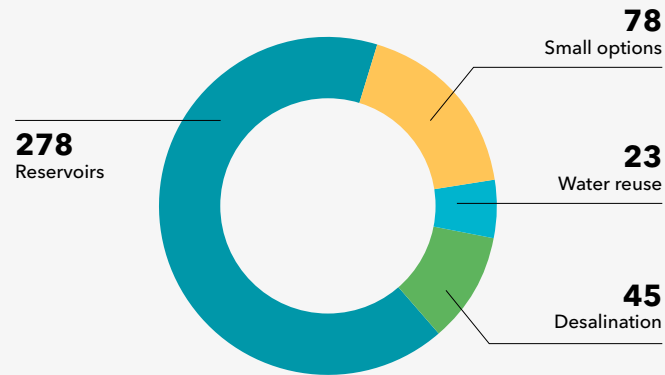
- Scale back or postpone the delivery of Environmental Destination flows within some waterbodies.
- For water companies to seek a delay to licence cap reductions until later in the 2030s due to the overriding public interest in providing secure water supplies. This is allowable under Regulation 19 of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. It should be noted that there is not a similar ‘public interest’ provision for the agri-food sector. Other than through the appeals process, licence capping in the agri-food sector cannot be postponed.

**Figure 6.2 emphasises the regional reliance on desalination should more sources of water supply be needed, whether driven by abstraction reductions or higher than expected consumption.** The pie charts represent the total capacity of new supply options through the planning period associated with our core and adaptive pathways. For the high consumption pathway, more water reuse and smaller options could be triggered but more desalination capacity would also be needed - and introduced earlier - so that deficits from the mid-2030s can be met. This is why a decision on whether consumption is tracking at or above expectations will be needed by around 2027. The lead time on desalination capacity is typically seven years.

Figure 6.2: Supply option mixes for different pathways to 2050

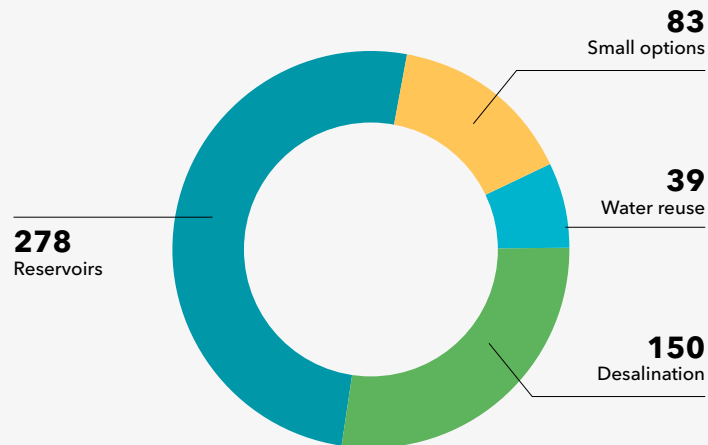
## Recover (BAU)

Total water available for use: 412 MI/d



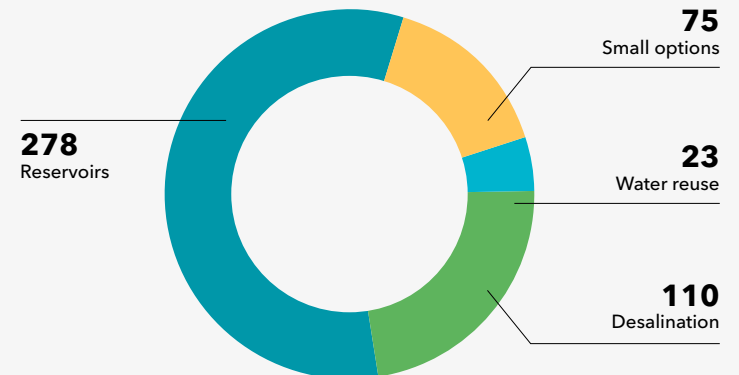
## High consumption

Total water available for use: 550 MI/d



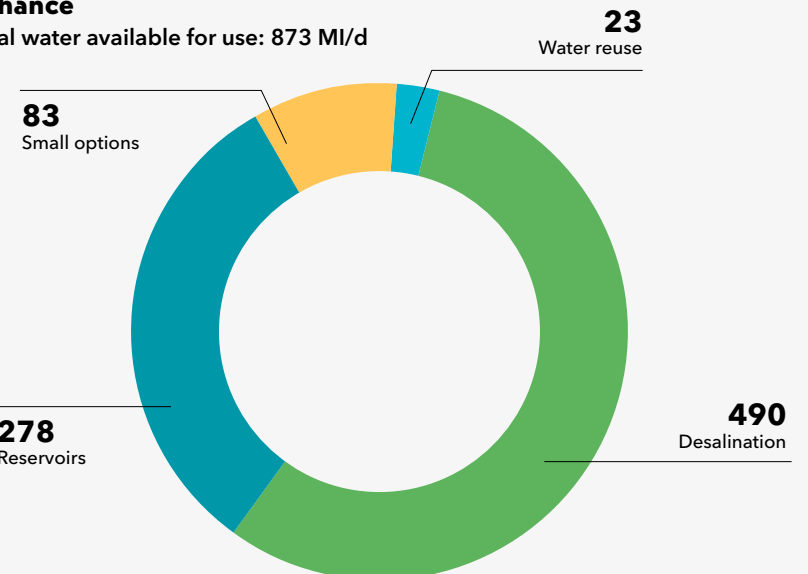
## Resilience (BAU+)

Total water available for use: 485 MI/d



## Enhance

Total water available for use: 873 MI/d



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## Monitoring and reporting progress on our Regional Plan

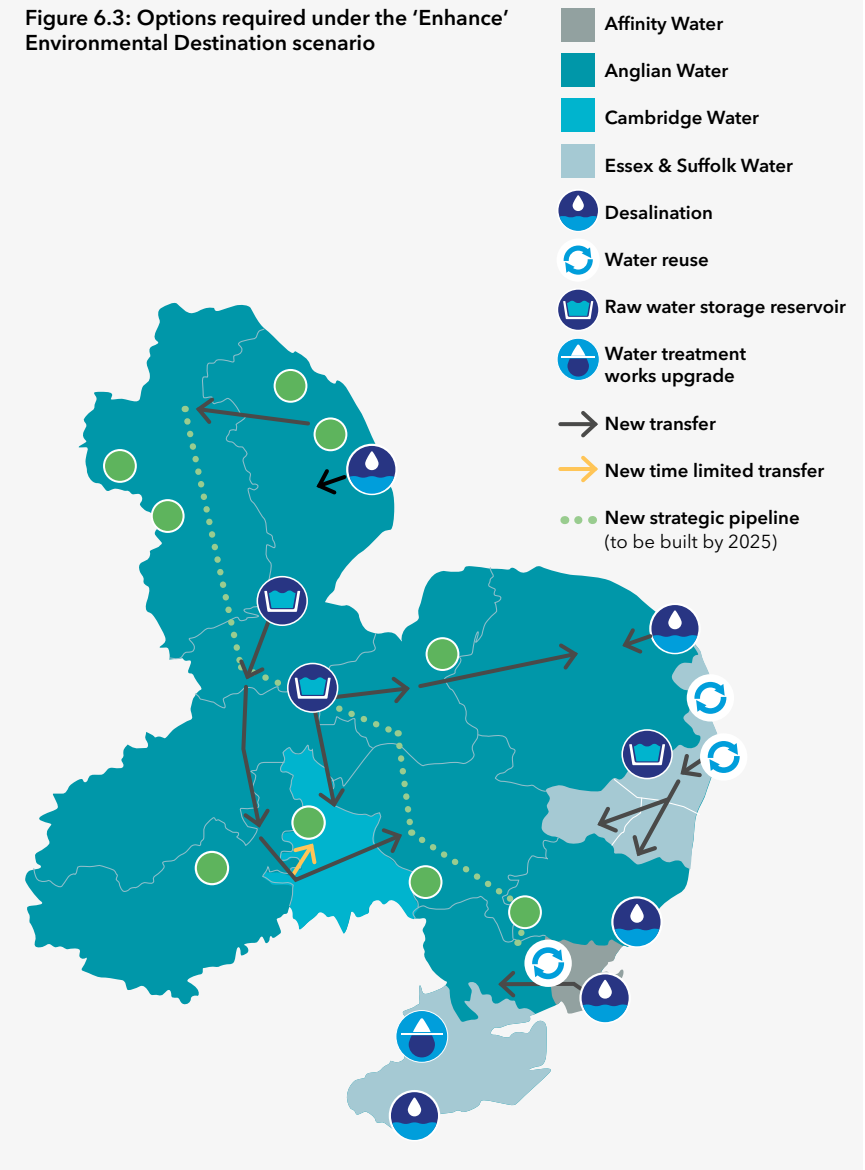
We fully support the Environment Agency's proposal for regional groups to play a role in monitoring progress in delivering regional plans and reporting regularly to government, regulators and other stakeholders.

The Environment Agency has proposed that:

- Regional groups should publish a progress report each summer to coincide with the existing WRMP annual review. These annual reports should track a suite of supply and demand-side metrics, and include updates on programme delivery and an assessment of the need to adapt or take action to mitigate any delays that may have arisen.
- A second annual 'check point' report each winter would provide an update on wider progress covering engagement with non-public water supply sectors and the delivery of multi-sector environmental investigations. This report could also include a progress update on the next round of regional planning, including the identification of new options and inter-regional collaboration.

We will work with members of the Regional Coordination Group to develop a core set of common metrics to use when tracking progress. As an initial proposal, we intend to track and report on the following metrics outlined in Table 6.1 (split by water company, water resource zone etc where appropriate).

Figure 6.3: Options required under the 'Enhance' Environmental Destination scenario



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Table 6.1: Initial set of metrics to monitor in reviewing our adaptive plan

Metric type and examples	Commentary
<b>Growth indicators:</b> <ul style="list-style-type: none"> <li>Population</li> <li>Housing build-out rate</li> <li>Local authority Local Plan housing and non-household projections</li> </ul>	<p>Rates of population and housing growth represent key assumptions in our plan. We have tested our plan against a range of projections but it will be important to track actual growth rates and whether future projections change. As each local planning authority consults on and then adopts a revised Local Plan we will check whether it implies a change in the pace of future growth including in non-household demand.</p>
<b>Supply-side indicators (MI/d):</b> <ul style="list-style-type: none"> <li>Water Available for Use (separately for existing sources, and new sources)</li> <li>Distribution Input</li> <li>Raw water losses</li> </ul>	<p>To track whether Water Available for Use is departing from Regional Plan assumptions, caused by for example accelerating abstraction licence reforms.</p> <p>Distribution Input provides an overall indicator of progress against the assumptions in our plan.</p> <p>Raw water losses are a measure of water wastage before it is treated and reaches distribution networks.</p>
<b>Demand-side indicators:</b> <ul style="list-style-type: none"> <li>Household Consumption (MI/d and l/p/d)</li> <li>Non-Household consumption (MI/d)</li> <li>Leakage (MI/d)</li> </ul>	<p>Tracking the three key measures of water use against assumptions in our plan and the interim targets set by government.</p>
<b>Delivery indicators:</b> <ul style="list-style-type: none"> <li>Metering and smart metering penetration</li> <li>SRO Gate approvals</li> <li>In-service dates for other key schemes</li> </ul>	<p>It will be important for us to track whether key delivery milestones are being met, both on demand-side activity and supply-side schemes. Larger infrastructure proposals carry considerable risk, and if these begin to slip then other options may need to be brought forward.</p>



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Metric type and examples	Commentary
<b>Environmental indicators:</b> <ul style="list-style-type: none"> <li>WFD status</li> <li>EFI compliance</li> </ul>	<p>These indicators may not be updated and change very frequently. Nevertheless they are important to track to see if our plan is having the desired impact on Environmental Flow Indicators, and in the longer term, the ecological status of waterbodies (such as by addressing water resource-related Reasons for Not Achieving Good).</p>
<b>Climate indicators:</b> <ul style="list-style-type: none"> <li>UK mean sea level</li> <li>Regional seasonal rainfall totals (averages and extremes)</li> <li>Regional seasonal temperatures (averages and extremes)</li> <li>Regional river flow indicators</li> </ul>	<p>Again, these indicators are unlikely to change frequently but will be useful to provide context to our progress reports and the climate projections used to inform our core and adaptive pathways and sensitivity testing.</p>
<b>Policy indicators:</b> <ul style="list-style-type: none"> <li>Water efficiency standards adopted for new development in local plans</li> <li>Introduction of water labelling, product standards, fittings regulations and other key policies</li> </ul>	<p>The government and local authorities have key roles to play in helping to deliver our plan, especially to help constrain growth in water use and to reduce water consumption per capita (see page 81). Policy development in these areas has been slow in recent years, with deadlines being missed where there has been a published timetable at all. We will track implementation of key policies and look to assess qualitatively their impact on levels of water consumption.</p>



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# 7 NEXT STEPS TOWARDS MULTI-SECTOR, CATCHMENT-BASED PLANNING

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Publication of this document and its supporting reports and appendices brings to an end the first round of regional planning for Eastern England. However, work is already underway to prepare for the next round which will begin in earnest in early 2024.

**A joint letter from government and regulators confirmed in January 2023 that there will be a second round of regional planning beginning straight away.**

This will inform decisions regarding water company investment plans at Price Review 2029 and will be much more integrated with catchment-scale and more localised water resources planning by abstractor groups and other sectors. A revised National Framework for Water Resources will set the specific requirements and timetable for the second round when it is published in spring 2025, following consultation in 2024. Other key milestones for developing our next regional plan by 2028 are shown in Figure 7.1 (on page 79).

**With a second round of regional planning confirmed, the WRE Board has taken the opportunity to update our business plan for the 2024 – 2028 period.**

This sets five strategic priorities with success measures for the next period (see Table 7.1 on page 78) and a number of immediate areas to take forward in lieu of the next National Framework being finalised in 2025. These include a range of steps we would like to take to prepare the ground for a more comprehensive, multi-sector regional plan being finalised in five years' time. For example we intend to, subject to funding:

- Review technical approaches together with other regional groups, national and local stakeholders and leading academics to develop **a new methodology and toolset to support the second round** of regional, adaptive, multi-sector planning.
- Work closely with our water company members to make an early start on their **Water Industry National Environment Programme** commitments for 2025-2030. Specially, we will help shape and coordinate the detailed WINEP investigations so that they underpin Environmental Destination requirements and options for all sectors in our next regional plan. These detailed studies could identify a range of ways to achieve the required environmental improvements, including through floodplain reconnection, river restoration and other nature-based approaches, rather than purely through changes to abstraction licences.

## Next steps on Environmental Destination investigations and other multi-sector studies

The Environment Agency is finalising guidelines to steer Environmental Destination (ED) investigations, options development and options appraisal studies starting in 2024 and 2025. The Environment Agency is also due to publish updated datasets to support this work in Spring 2024.

The developing guidance for ED investigations is currently centred around the Water Industry National Environment Programme (WINEP), but we will work with the Environment Agency, water companies and the other regional groups to help ensure that these guidelines meet the needs of all sectors.

WRE is also supporting a UK Water Industry Research (UKWIR) project to develop consistent approaches to ED investigations, due to begin in January 2024.

Subject to funding being made available, we plan to support early-start ED investigations and catchment trials in early 2024 before full funding and the next WINEP begins in earnest in April 2025.

Both ED investigations and options development studies will need to be completed in time to provide inputs to the next round of regional plans and water company plans. With draft plans likely to be coming together in 2027, these studies will need to be completed by the end of 2026. This mirrors the default completion date for WINEP studies of December 2026.

However, we recognise that the water industry's planning cycle is just one of many planning and delivery cycles that will play a part in achieving progress toward environmentally sustainable abstraction and genuine environmental improvement.

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- Support abstractor groups, the NFU, Defra, the Rivers Trust, the Environment Agency and other regional groups to develop **catchment-scale tools that support multi-sector planning**, and work in partnership with abstractor groups to identify **local water resource options** that may meet their needs. This will build upon the work of WRE's Agri-Environment Task and Finish Group and the Water for Tomorrow programme that drew to a close early in 2023.
- Launch a **Norfolk Water Fund** as a blended investment vehicle, and support the Anglian Water/Rivers Trust **East of England Planning Hub** to build capacity and develop a strong pipeline of nature-based solutions projects that deliver multiple objectives. Both of these initiatives will help lay the foundations for Anglian Water's **Advanced WINEP** ('A-WINEP') proposal for AMP8 (2025-2030) that will take a more, holistic, outcome-based approach to environmental improvement across the Norfolk and Cam & Ely Ouse catchments.
- Developing stronger relationships with **catchment partnerships and the Catchment-Based Approach**, including the CaBA National Water Resources Group. We will be developing and piloting training materials to help local partnerships to understand water resource pressures and build proposals and local water resources options as part of their future catchment plans.
- Support lead authorities across the region to prepare their **local nature recovery strategies**, so that these contribute toward national targets for the water environment and help deliver improvements in water resources and environmental water quality. The work to date on the Norfolk Water Strategy Programme means we are best placed to do this for Norfolk County Council, but we will support other responsible authorities too if we can.

**We will also continue to take forward a suite of flagship projects, aiming to be active and involved in projects spanning the region.** These test and trial innovative approaches to water resources and integrated water management at more localised scales (Figure 7.2), and will help develop the evidence base to support the multi-sector aspects of our next regional plan.

Strategic priorities	Measures of success
Develop a more comprehensive, fully multi-sector, regional water resources plan for Eastern England	<ul style="list-style-type: none"> <li>More resilient water supplies for all sectors, including in times of drought</li> <li>Progress toward achieving the 'Enhance' environmental destination outcomes by 2040 at the latest, with early delivery in priority waterbodies</li> </ul>
Support catchment-scale activity across the region to enable long-term planning and environmental improvement across sectors	<ul style="list-style-type: none"> <li>Catchment-scale plans show how future water needs for all sectors can be satisfied</li> <li>Future plans for economic and housing growth, agricultural production and net zero energy investment recognise and are consistent with the water scarcity challenge</li> </ul>
Increase our membership, engagement and influence within the region	<ul style="list-style-type: none"> <li>WRE members feel involved and engaged in our work as part of a collaborative, co-creation process</li> <li>Others' plans such as local nature recovery strategies, local development plans and CaBA partnership plans deliver improvements to the water environment</li> </ul>
Be thought leaders and pioneers of collaborative approaches to integrated water management, helping to shape national government policy and local delivery	<ul style="list-style-type: none"> <li>WRE's policy priorities taken forward by government, including in the next National Framework and wider reforms proposed to governance of the water environment</li> <li>Water company investment in strategic resource options deliver wider public benefits</li> <li>Integrated water management pilots and projects are underway in every part of the region</li> </ul>
Continue to strengthen WRE's governance and funding	<ul style="list-style-type: none"> <li>WRE funded to achieve its vision and multi-sector planning ambitions</li> <li>WRE's board continues to have strong sector and geographic representation and improving gender and ethnic diversity</li> </ul>

Table 7.1: WRE's refreshed business plan priorities and measures of success for the 2024 - 2028 period

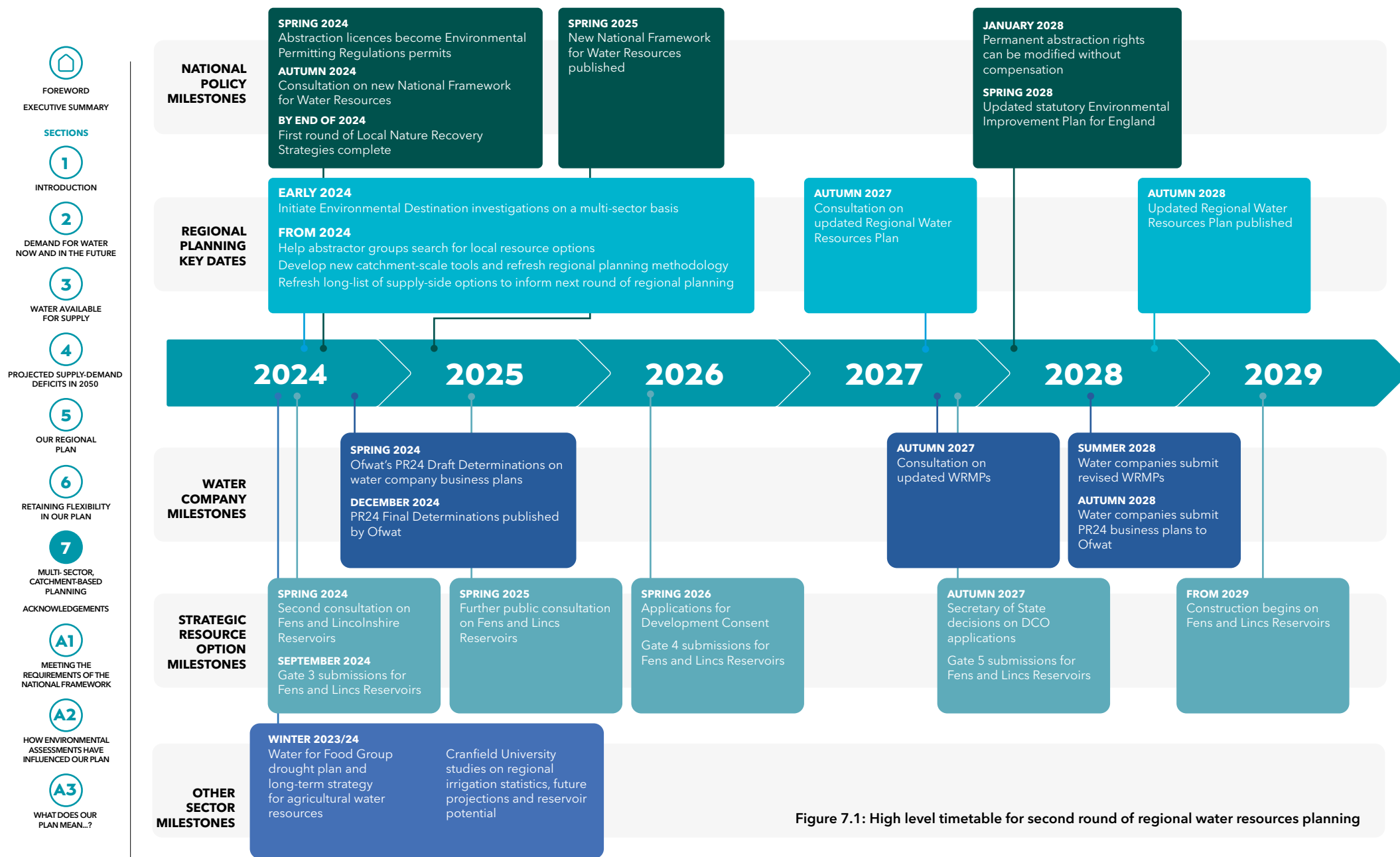


Figure 7.1: High level timetable for second round of regional water resources planning

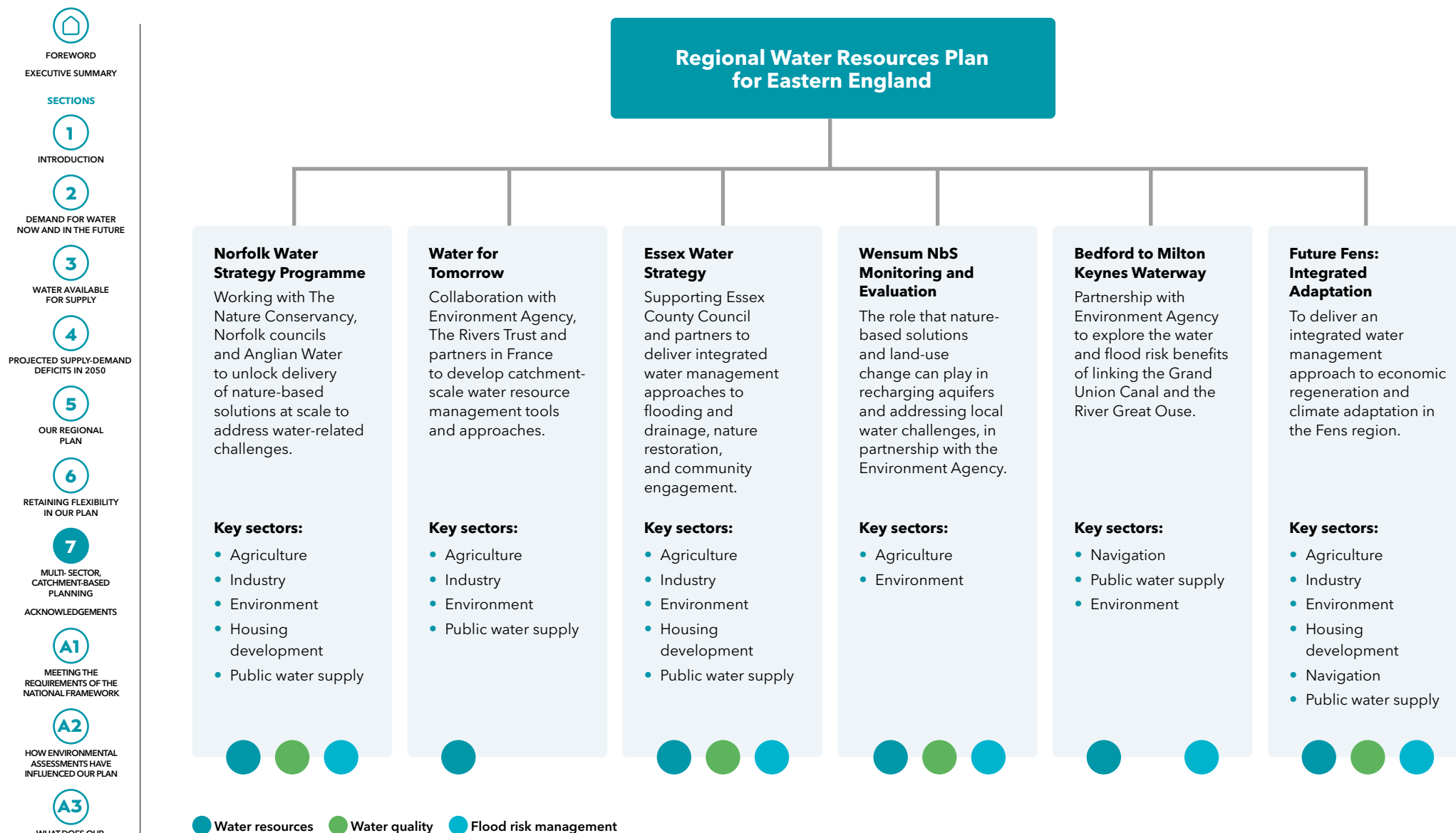


Figure 7.2: How our flagship projects are informed by, and have influenced, our Regional Plan

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## Policy priorities for government on demand management

The most direct impact the government can have on our plan's success is in taking forward policies that help all sectors to capture and conserve water and use it more efficiently.

**There are several new policies in the pipeline that could have a positive impact in reducing both household and non-household consumption. These are discussed below.** We assume in our plan that government policy support will help reduce household per capita consumption (PCC) by 11-14 litres per person per day (l/p/d) by 2050, so that overall combined with other measures, PCC falls to 110 l/p/d in line with the ambition within the National Framework. Non-household consumption should also benefit as a result of these policies but at this stage we cannot include estimates in our plan with any confidence.

- National water consumption target:** The Environment Act 2021 requires the government to set a series of long-term, legally-binding targets for nature, air quality, resource efficiency and water. A national water consumption target for England has now been set in statute following public consultation. This requires a 20% reduction in 'Distribution Input' per capita by 2038 versus a 2019/20 baseline. The new Environmental Improvement Plan and Plan for Water reinforced this target together with sub and interim targets for leakage, per capita consumption and non-household consumption. See Figure 5.5, page 51 for more details.
- Water labelling:** A [Written Ministerial Statement from Defra](#) in July 2021 made a number of policy proposals to help reduce demand for water. The most prominent of these was a commitment to introduce a mandatory water efficiency label to inform consumers and encourage the purchase of more water efficient products for both domestic and business use. A [consultation on proposals](#) was launched by the government in September 2022, and the government has since confirmed that a [mandatory label will be introduced in 2025](#). But at the consultation stage, the proposed phased approach only promised to deliver a quarter of the potential scheme's water savings. We would like the full scheme to be introduced as soon as possible, including minimum water efficiency product standards for taps, showers, toilets and white goods, and a link to improved Building Regulations so that only the most water efficient fixtures and fittings are installed in new homes.
- Letter to Planning Authorities:** The ministerial statement also committed Defra to write to Local Planning Authorities (LPAs) to encourage them to adopt the tighter 110 l/p/d water efficiency standard for new homes within their Local Plans. This standard is already an option within Building Regulations Part G where it can be justified. After some delay, the letter was finally sent in September 2022. As well as promoting the 110 l/p/d standard, the letter usefully encourages LPAs to discontinue use of the 'water calculator' element of Part G and focus on the alternative fittings-based approach. However, as most LPAs in Eastern England have already adopted the 110 l/p/d standard the letter is unlikely to have any impact on new homes in the region, especially because there is very little if any checking and enforcement of these standards.
- Building Regulations roadmap:** A roadmap toward greater water efficiency in new developments and retrofits was published as part of the [Environmental Improvement Plan](#) in January 2023. Many of the ten actions within the roadmap will have benefits for existing properties, including commercial and public buildings. The actions include a review of water fittings regulations to address leaking toilets, integrating water efficiency into energy efficiency advice and retrofit programmes, and introducing water labelling as discussed above. At the core of the roadmap is the proposal to consider tightening the default water efficiency standard for new homes to 105 l/p/d (from 125 l/p/d at present) with the option of a 100 l/p/d standard being adopted where there is a clear local need (110 l/p/d at present). Whilst these commitments are welcome the roadmap suggests it may take a decade to deliver them all. This needs to be accelerated.
- Public engagement on water efficiency:** Alongside existing water efficiency communication plans and campaigns undertaken by water companies, Water UK and Waterwise, Ofwat announced in their PR24 Methodology that they would set aside up to £100 million "to help stimulate a transformative, sustained and measurable reduction in water demand nationally, using a range of water efficiency approaches." A [consultation launched in July](#) invited ideas on how this money should be allocated, with a central theme to create a "well-resourced, collaborative, sustained and widescale water efficiency behaviour change campaign." This would be welcome, especially if reinforced by water efficiency messaging from government. We would like to see such a campaign including education and more information in schools; young people are often more receptive and can be key to influencing hard-wired behaviours at home. Subject to further consultation campaigns could begin in April 2025.



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- **Non-household action:** Businesses, public sector bodies and other non-household users account nationally for 20% of 'Distribution Input' (the amount of water entering the distribution system). Opening up the non-household market to retail competition was in part justified by the potential water savings that competition would unlock, but this hasn't happened in practice. [A water efficiency sub-group of the Retailer Wholesaler Group](#) has made a series of recommendations to promote water savings, all of which we endorse for action by government, regulators, and water companies (including retailers). We would like to see these recommendations being taken forward urgently, especially to support an accelerated roll-out of smart meters and data standards that underpin much closer working between wholesalers and retailers.

WRE helped Waterwise publish a new [UK Water Efficiency Strategy to 2030](#) in September 2022, with ten strategic objectives covering the household and non-household sectors. Collectively, Waterwise estimates that their action plan could cut UK water use by 1,500 Ml/d by 2030.

## Multi-sector considerations: a 'systems-thinking' approach

Catchments are very complex systems. How water is used and managed across them varies enormously. It is hugely challenging to gain a complete picture of all of the hydrological, environmental, political, legal, economic and social processes that are relevant to solving water resource problems. If these different perspectives could all be brought together in a shared representation, it would show how each of these factors can affect the decisions that need to be made, and how the decisions made by one set of water users may have a knock-on effect on others within the catchment.

Through the [Water for Tomorrow programme](#), our partners, The Rivers Trust, are tackling this challenge and to-date have published [five sector models representing agriculture, ecology, industry, regulator and water company perspectives](#). The sector models will be integrated into a single 'whole system' model capturing stakeholders' shared understanding of water scarcity and ultimately helping to build consensus on a way forward. Greater collaboration is a pre-requisite for decision-making on long-term water planning.

The Rivers Trust is using a collaborative technique called participatory modelling which develops shared representations of a reality (typically a problem) facing groups of stakeholders. The approach is being used to map out diverse knowledge from a wide range of stakeholders, so that complex water resource systems can be visualised and understood in their entirety. Stakeholders from the Cam & Ely Ouse, Broadland and East Suffolk catchments have been engaged in mapping out their knowledge of water use, and the problem of water scarcity, from their own sector's perspective.



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## The Board would like to thank:

**The WRE team that produced this plan:** Rebecca Bishop, Ben Fitzsimons, Daniel Johns, Alice Rigg and Katharine Smart, supported by Kirsty Goddard-Holmes and Julia Beeden, and recent WRE alumni Rachel Dyson, Luke Waterman, Mhari Barnes, Steve Moncaster, Robin Price and Nancy Smith.

**The many cross-sector stakeholder representatives that form our Technical Delivery Group and Consultation Group, the water resources teams within our four water company members, and our main contractors leading the detailed work and providing technical assurance:** Defra, RAPID, Ofwat, Environment Agency, Natural England, Consumer Council for Water, National Farmers' Union, the Association of Drainage Authorities, Canal & River Trust, Affinity Water, Anglian Water, Cambridge Water, Essex & Suffolk Water, Broads Authority, Essex County Council, Norfolk County Council, Suffolk County Council, Cambridgeshire and Peterborough Combined Authority, Broadland Agricultural Water Abstractors Group, East Suffolk Water Abstractors Group, Lark Abstractors Group, the University of Manchester, Cranfield University, Energy UK, Uniper, RWE, AqualInform Ltd, The Rivers Trust, Blueprint for Water, Atkins Global, Nexsys Analytics, Mott MacDonald, HR Wallingford, Jacobs and Fothergill Training & Consulting Ltd.

**WRE's more than 180 members that form our Strategic Advisory Group for their contribution to Task and Finish Group meetings, SAG webinars and workshops.**



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## WRE's members and multi-sector stakeholders





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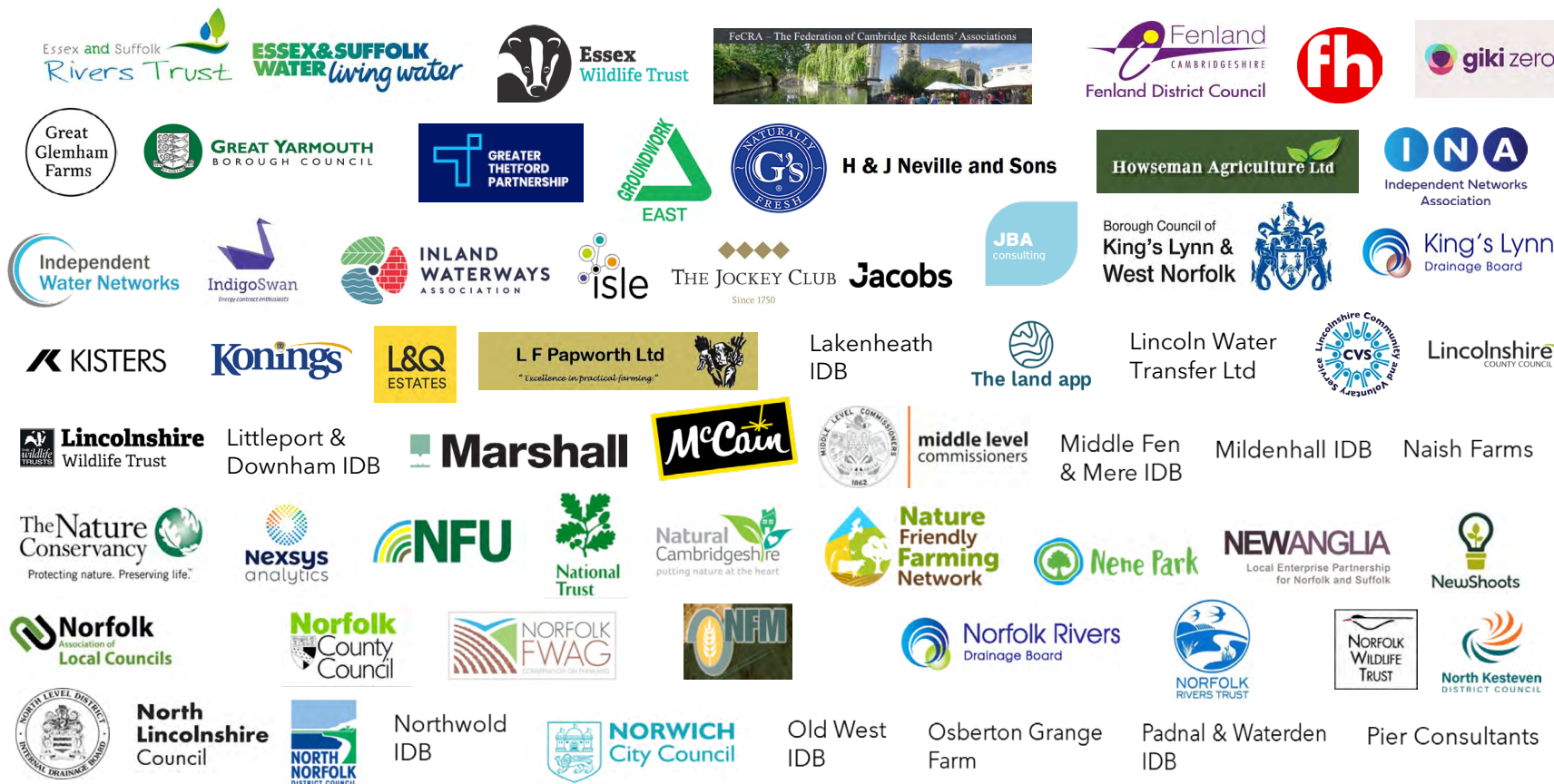
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The National Framework for Water Resources published in March 2020 includes a series of requirements for regional water resources planning, categorised by whether they are a 'must do', 'should do' or 'could do'. The table below summarises how we have prepared our final Regional Plan in response to these requirements.

Action type	Action/Plan requirement	How we have addressed this
 <b>Must</b>	Take account of the national framework and set out the Regional Plan's contribution to the national need.	<p><b>Water efficiency and reducing leakage</b></p> <p>All the participating water companies support the National Framework, which set ambitious targets for both leakage and per capita consumption (PCC). Each water company in the WRE region has conducted cost/benefit analysis to determine their own ambitious targets for achieving reduced leakage and PCC. Our plan is based on achieving a PCC of 110 l/p/d by 2050, and a 39% reduction in leakage by 2050. Whilst the ambition on leakage is below the ambition in the National Framework, that is because our largest companies – Anglian Water, Cambridge Water and Essex &amp; Suffolk Water – already occupy industry-leading positions with less scope for further reductions than elsewhere in the country. Overall within the WRE region, we expect to achieve a 19% reduction in public water supply consumption ('distribution input') per capita by 2038 against the statutory national target of 20%.</p>
 <b>Must</b>	Take account of the national framework and set out the Regional Plan's contribution to the national need.	<p><b>Increasing supplies and transferring water</b></p> <p>Our modelling has identified a series of low-regret water resource options that perform well under a variety of growth, climate change and environmental scenarios. Two of these low-regret options, the Fens and Lincolnshire reservoirs, are being progressed through the gated process governed by the Regulators' Alliance for Progressing Infrastructure Development (RAPID). WRE is working with the reservoir promoters and by chairing the Fens Water Partnership and South Lincs Water Partnership to ensure that these schemes are designed with multi-sector beneficiaries in mind.</p> <p>Our final Regional Plan provides for a level of drought resilience from 2039 so that the chance of emergency drought restrictions in any given year is no more than 0.2% (a 1-in-500 annual chance). WRE's member water companies are committed to working with the Environment Agency to ensure that there is no additional reliance on drought measures where they might be environmentally damaging.</p> <p>WRE also joined the four other regional groups in a regional reconciliation of our Regional Plans in 2022 and again in early 2023. This helped stress-test and validate plans, as well as explore the strengths and limitations of new and existing inter-regional transfers. This process confirmed our proposal for no additional inward or outward transfers of water to the other regional group areas during the planning period. However, the process identified the potential for a temporary 'reverse trade' of the existing transfer between Anglian Water and Affinity Water in order to supply Cambridge Water instead until the Fens Reservoir comes into supply.</p>



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Action type	Action/Plan requirement	How we have addressed this
Must	Be reflected in WRMPs.	WRE's approaches and close working with member water companies (especially through WRE's Alignment Task & Finish Group) ensure that our Regional Plan feeds directly into water company Water Resource Management Plans (WRMPs) and that option development and refinement through the WRMP process feeds back up into the Regional Plan.
Must	Forecast supply and demand over at least 25 years and set out solutions to any deficits.	The Regional Plan is focused on the period 2025-2050. WRE's forecasts of supply and demand include the impacts of climate change, demand management options, enhanced environmental improvements, future housing and economic growth, and the growth ambitions of other sectors.
Must	Be a single plan with one preferred adaptive solution and set of options.	Our Regional Plan provides an adaptive programme of investments and initiatives, including alternative options and timings if needed to resolve deficits in the public water supply. Our preferred adaptive solution keeps the 'Enhance' Environmental Destination in play whilst allowing time for further investigation to take place to establish a more robust assessment of environmental requirements at the water body and catchment scale.
Must	Take a multi-sector approach.	WRE's unique governance model has allowed us to undertake significant engagement across sectors throughout the development of the draft and this final Regional Plan, and we continue to draw upon our membership to shape our approach and explore cross-sector opportunities.
Must	Look beyond regional boundaries and use technical approaches and scenarios compatible with other regions.	WRE has been actively involved in the Regional Coordination Group, in particular through the regional reconciliation process as well as coordinating across regional boundaries on the SRO schemes. We have also worked closely with WRSE on growth scenarios associated with housing developments in the Oxford to Cambridge region.





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Action type	Action/Plan requirement	How we have addressed this
 Must	Consider enhanced environmental improvements and demand management.	WRE has worked with the Environment Agency, Ofwat, Natural England and the other regional groups to develop consistent long-term Environmental Destination scenarios. These focus on achieving the 'no deterioration' requirement under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, addressing unsustainable abstraction and improving environmental resilience whilst taking into account the impacts of climate change. WRE's ambition is to achieve the most ambitious environmental improvements described under the 'Enhance' scenario.
 Must	Take a catchment-based approach.	WRE has actively worked with local stakeholders and other partners to understand catchment-specific constraints and opportunities and their priorities for water resource improvements and environmental enhancement. Examples include the Ant Valley Water Resources Strategy and Delivery Groups, our Systematic Conservation Planning project, and Water for Tomorrow. We also held four catchment-focused workshops in late 2021 for local stakeholders to help inform our Emerging Regional Plan published in January 2022. WRE's work on the Norfolk Water Strategy Programme also continues, examining the benefits of and possible funding mechanisms for the implementation of nature-based solutions at scale to address water security challenges. We hope that the approaches developed in Norfolk can be rolled out elsewhere in the region and country including through the Rivers Trust and United Utilities-led <a href="#">Mainstreaming nature-based solutions to deliver greater value project</a> supported by the Ofwat Innovation Fund, and Anglian Water's Advanced WINEP proposal in their PR24 Business Plan.
 Must	Consider resilience benefits, including reducing flood risk, when developing options.	WRE's work with our member water companies promoting the SROs seeks to ensure that they are designed in the context of the wider system and they achieve multi-functional benefits across sectors, as well as enhanced resilience for the public water supply. At the scheme level, our Integrated Environmental Assessment approach has allowed us to track positive and negative environmental effects of options, including for flood risk.
 Must	Be open to market mechanisms.	WRE has co-funded research into financing mechanisms for multi-beneficiary water infrastructure schemes. We recognise that actions included within the Regional Plan may need to be owned and delivered by other parties, including through market-based funding mechanisms.

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Action type	Action/Plan requirement	How we have addressed this
 <b>Must</b>	Take into account growth ambitions.	Our forecasts out to 2050 are based on a range of plausible scenarios for population and economic growth in the region and include projections of water demand for other key sectors such as agriculture and energy production.
 <b>Must</b>	Comply with Strategic Environmental Assessment and Habitats Regulation Assessment legislation.	WRE has undertaken an Integrated Environmental Assessment (IEA) of regional supply options that complies with this legislation. For details, see the IEA summary report published alongside this Regional Plan.
 <b>Should</b>	Engage widely with interested groups.	WRE has engaged with stakeholders throughout the production of this Regional Plan. Our independence and unique membership model enhances our ability to engage in a meaningful way. Our Technical Delivery Group and Strategic Advisory Group both operate on a multi-sector basis, as well as the plan itself being approved by our multi-sector Board.
 <b>Should</b>	Set out how the region will respond to drought and agree common scenarios for drought actions	Enhancing this approach will be an area for further consideration by WRE in the next round of regional planning. WRE has now formed a Drought Group focused on building awareness and identifying options to share water between sectors and protecting the environment during periods of extended dry weather.
 <b>Should</b>	Join up with water companies Drainage Water Management Plans (DWMPs).	This is a longer-term ambition that is still being explored by water companies as part of their Long-Term Delivery Strategies that have been compiled for the 2024 Price Review. At a more localised scale, our work on the SROs and catchment-based projects (e.g. Future Fens, Norfolk Water Strategy Programme, Water for Tomorrow, Essex Water Strategy) take an integrated water management perspective.

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Action type	Action/Plan requirement	How we have addressed this
 <b>Should</b>	Seek to improve resilience to events other than drought, particularly floods.	WRE is championing flood resilience as part of the system design work underpinning the two SROs, and our Norfolk Water Management Strategy and Future Fens: Integrated Adaptation exemplar projects were established with improved flood resilience as core objectives.
 <b>Should</b>	Look ahead 50 years or more.	Our Regional Plan looks 25 years ahead, but the costs and benefits of individual options are assessed on a longer-term basis. Beyond 2050, additional supply-side options are likely to focus on more desalination and water reuse. The ideal size of these options can be considered in future rounds of regional planning.
 <b>Could</b>	Contain all the detailed information required for WRMPs.	We have achieved vertical alignment between WRMPs and WRE's final Regional Plan. We have also helped ensure horizontal alignment between companies' WRMPs as far as possible. This process is managed by WRE's Alignment Task & Finish Group. This plan has associated technical reports and data tables as requested by the Environment Agency, which mirror those produced for WRMPs. Our Regional Plan has been subjected to the same degree of environmental assessment as draft WRMPs.
 <b>Could</b>	Contain all the detailed information required for Drought Plans.	WRE's member water companies do not believe this is the best approach at present. There would be a number of issues to resolve, such as the approach for companies with extra-regional WRZs and the alignment of levels of service across companies. More fundamentally, the new regulatory expectation that drought plans are tactical, operational manuals means that they are more appropriately managed at company level. However, WRE's companies have worked alongside WRSE and its member companies to address common issues and align approaches where appropriate.



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**The overall aim of the Regional Plan, as well as addressing the water deficits to 2050, is to improve the ecological health of waterbodies and water dependent habitats within the region, primarily by moving abstraction to more sustainable sources, leaving more water in sensitive environments, and securing more resilient sources of supply.**

**The environment is the single biggest driver of investment within our Regional Plan, but it is critical that the options the plan contains do not result themselves in significant unintended environmental consequences.**

The regional plan-making process involves undertaking various environmental assessments to inform whether the plan as a whole, or individual elements (e.g. new supply options), can be taken forward without unacceptable environmental risks that cannot be mitigated.

To this end, WRE's Environment Task and Finish Group developed an Integrated Environmental Assessment (IEA) process for the Regional Plan to provide information on the likely environmental consequences (positives and negatives) of implementing the Regional Plan and alternatives to it. The independent IEA process, undertaken by Mott MacDonald and independently supported by Fothergill Training & Consulting Ltd, is designed to provide pertinent environmental information at key steps of the plan-making process to enable better decision making.

**The IEA is an approach we have developed to deliver an effective, consistent and efficient process across six regulatory environmental assessment processes, in line with the [Environment Agency's National Planning Policy Framework](#) and [Water Resources Planning Guidelines](#).** These are:

- Strategic Environmental Assessment (SEA).
- Habitats Regulation Assessment (HRA).
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

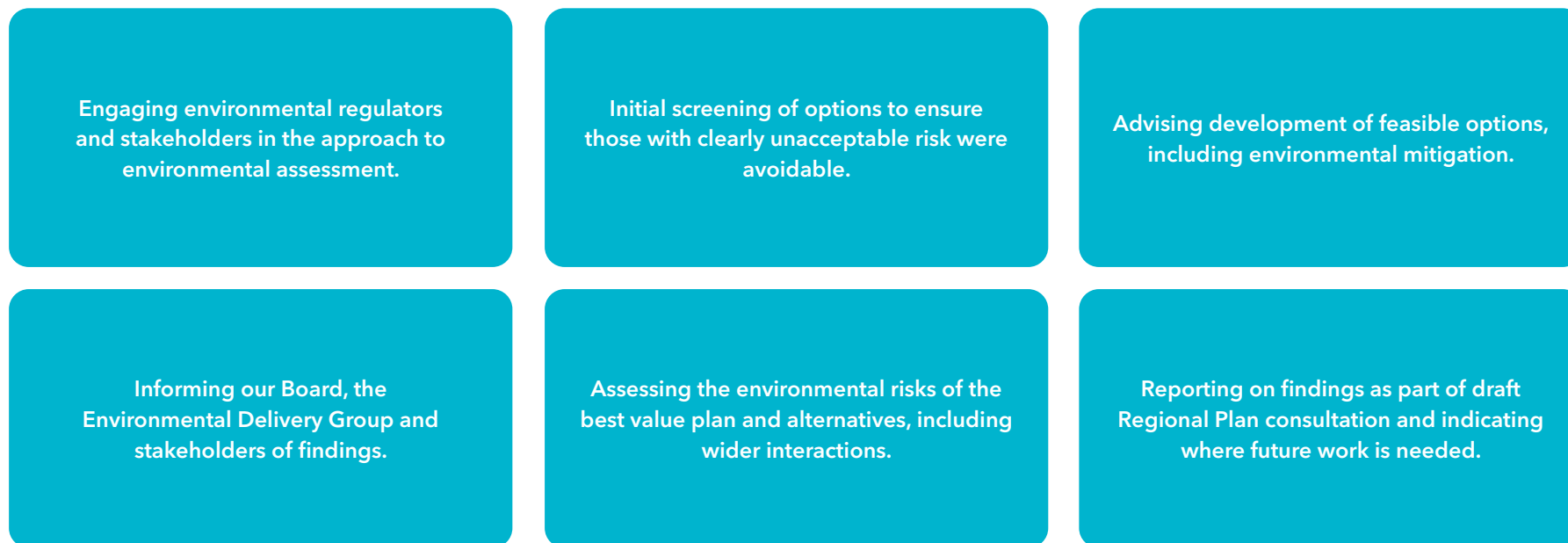
- Invasive Non-Native Species Assessment (INNS).
- Biodiversity Net Gain Assessment (BNG).
- Natural Capital Approach - Ecosystem Services Assessment (NCA via ESS).

The suite of assessments forming our IEA have been carried out by the consultancy Mott MacDonald on WRE's behalf, with the process and its findings having influenced the development of the draft and this final Regional Plan in a number of ways:

- High-level environmental screening of our unconstrained list of supply options. This removed some options because of unacceptable environmental risks and provided advice to improve the environmental performance of other supply options in our shortlist.
- Each feasible supply option was put through a detailed assessment that allowed us to predict its environmental consequences. This allowed us to determine the relative environmental risks and opportunities associated with different combinations of schemes.
- The findings of these detailed assessments were made available at multiple stakeholder workshops during the plan-making process. Specific findings formed part of the multi-sector performance metrics - discussed in our plan approach - to help enable consideration of the core best value plan and its alternatives (least cost, best for the environment, etc).
- As the Regional Plan took shape, we used an iterative approach, working between WRE's members, Natural England and the Environment Agency, so that local knowledge and details contained within the environmental assessments could inform the appropriate selection of options and portfolios.

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Figure A2.1: Environmental Assessments interacting with and influencing our regional plan-making



**At the scheme level, our IEA approach has allowed us to track positive and negative environmental effects of options, along with habitat units requiring replacement, as metrics within our modelling work.** Developing new supply schemes such as long-distance pipelines or new water treatment works clearly pose a risk to various aspects of the environment, including biodiversity, water, air, soils and the landscape within and around their locations.

The IEA process has identified where these risks can be mitigated through existing good practice or through more bespoke design considerations. This included an assessment of whether options result in gains or losses in habitat units using the government's Biodiversity Net Gain Tool.

**Overall, our biodiversity net gain assessment has found our best value plan will lead to a net increase in habitat units across the region. However, we recognise this is driven by the new reservoir options; other supply options lead to a loss of habitat units.** These losses will be replaced as part of their delivery so that, as a minimum, 10% net gain in habitat units is achieved. This approach aligns with the regulatory requirements set out in the Environment Act 2021 and Environmental Improvement Plan 2023.

Where biodiversity gain is required in the delivery of supply options, we will encourage the relevant water company to consider the mitigation hierarchy, as well as draw on our Systematic Conservation Planning (SCP) project and integrate their proposed habitat enhancements with the new Local Nature Recovery Strategies (LNRSs) being developed. This will help maximise the environmental benefits and biodiversity gains associated with delivery of the plan.



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**The supply options identified in our Regional Plan are at a relatively early stage of design. In many cases, it is not possible to completely rule out the possibility of direct or indirect impacts on designated habitats and Water Framework Directive (WFD) waterbodies to the satisfaction of the precautionary principle applied through various environmental regulations.** This is particularly the case as we carry out further work to determine the combined effects of options and schemes set out in other plans (such as individual water company plans and the plans of the other regional groups). We are working closely with water companies and other regional groups especially where the operation of schemes might collectively impact river, coastal and estuarine habitats. Further environmental assessment work will be conducted during the detailed design of options and schemes, with new research and environmental data collection likely to be needed as part of the early stages of the planning approval process.

**We intend for the Regional Plan to contribute toward the water industry's [Net Zero 2030 Routemap](#).** Our assessment of carbon impacts and the opportunities to decarbonise elements of option design and implementation has developed considerably since the draft plan stage and has influenced the selection of options and their proposed timings.

More information can be found in the IEA non-technical summary report published alongside this final plan.





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# For the environment

WRE's ambition is to deliver the most ambitious environmental outcomes described by the 'Enhance' Environmental Destination scenario.

## The 'Enhance' scenario entails:

- Supporting the achievement of 'Good Ecological Status' (GES) or Good Ecological Potential (GEP) in all waterbodies.
- Providing extra protection for European Protected Sites; and
- Delivering enhanced protection for chalk streams, sensitive headwaters and nationally-designated water-dependent habitats.

It is our intention, with the support of our members, to continue to challenge those with the remit and powers to invest in water management (including water companies, regulators, land managers, internal drainage boards, local authorities, etc.), and to do so in such a way that keeps these 'Enhance' outcomes within reach as we learn more about how they can be most effectively realised and delivered in the shortest time possible.

**Whilst traditional mechanisms such as the Water Industry National Environment Programme (WINEP) have delivered significant investment in the environment, many waterbodies in our region still fall short of good ecological status or potential, including as a result of flow requirements.** Previous attempts to improve flows through changes to abstraction have been hampered by a lack of agreed long-term environmental improvement goals for river and waterbody flows that all parties work toward.

By defining long-term goals for sustainable abstraction, this Regional Plan has explored a series of adaptive pathways that aim to achieve sustainable abstraction in our region and facilitate key discussions on deliverability and affordability.

Whilst our plan submitted to water and environmental regulators for the purposes of the National Framework for Water Resources is based on the 'Resilience' (BAU+) scenario to align with new supply-side options nationally and with our member water companies' WRMPs, we ultimately remain focused on WRE's preferred environmental outcomes as described by the 'Enhance' scenario. We have outlined in this Regional Plan what additional supply options would be needed to achieve the 'Enhance' destination.

**Further investigations due in the period 2025-2030, led via the water industry's WINEP process alongside continued work at a more local level, will help us to develop more specific requirements for investment and schemes that may make better use of resources whilst prioritising environmental outcomes where they are most important.** WRE aims to work closely with water companies to help achieve key objectives under their WINEP programmes for sustainable abstraction:

- Achieve more volumetric certainty for sustainability reductions to licences.
- Improve the understanding of impact to environmental flows from other sectors and facilitate sharing of data more widely.
- Establish where the greatest environmental benefits could be realised in our region.
- Consider alternative approaches to measuring sustainable abstraction (e.g. abstraction as a percentage of aquifer recharge).
- How complementary catchment measures, such as nature-based solutions, can improve environmental resilience in the interim.
- Better understand the costs and benefits associated with achieving different outcomes for sustainable abstraction.
- Continue to engage with regulators, environmental non-government organisations (eNGOs) and other catchment stakeholders on key environmental objectives for waterbodies and water-dependent sites.



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**It is worth noting that delivering the aims of the 'Enhance' scenario may not in some cases require the degree of abstraction reductions our scenarios currently indicate.** For example, the CaBA [Chalk Stream Strategy](#) found that abstraction reductions can be avoided if other more tailored and beneficial interventions can be delivered at a local level, such as tackling water quality and restoring natural processes (e.g. reintroducing meanders and river-bed restoration).

Table 3.2 on page 34 shows through our modelling the potential water returns to the environment (i.e. no longer abstracted) across a range of sectors and Environmental Destinations, and the required reduction in the different licence abstractions required to meet this need.

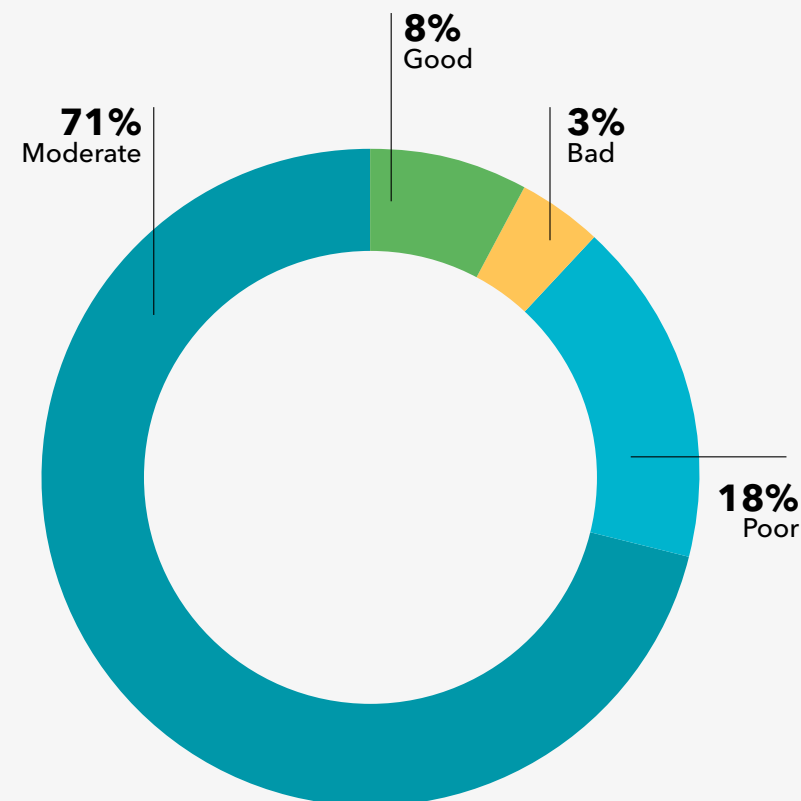
By far the biggest reduction in water abstraction is achieved via the public water supply sector's change in licences, followed by the agricultural sector. Information on the latter is explained in the farmers and growers annex to this plan.

## Latest ecological assessment of waterbodies in Eastern England

**Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 classifies the overall ecological status of surface waterbodies (such as streams, rivers and lakes) as either high, good, moderate, poor or bad.** This is decided based on the level of human influence or pressure put on each body of water. 'High' means no or very little human influence or pressure, and 'bad' means significant or detrimental human influence or pressure. Sufficient flow is an important element of a body of water achieving 'good' ecological status.

Only 8% of surface waterbodies in the Anglian river basin district are in 'Good' ecological status. There is an urgent need to restore, protect and enhance waterbodies in the WRE region and nationally.

Figure A3.1: Ecological status of surface waterbodies, WRE region





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## Future work

**There is an urgent need to restore, protect and enhance the waterbodies in the WRE region and nationally.** Capping licences to existing levels won't be enough to support good status within the freshwater environment.

Changes to abstraction licences will need to take place alongside actions to tackle water quality and land management in order to achieve the environmental improvements stakeholders want for the region.

We recognise that the tools used to derive these deficits to date are a starting point for more detailed work. Whilst we have exercised technical rigour in our work, the tools we have deployed at a regional scale for a strategic plan cannot adequately reflect the true needs of some of the region's smaller but most sensitive habitats and rivers (noting that these needs may include flow improvements alongside water quality and physical habitat improvements).

**Ongoing investigations and research between 2025 and 2030 will help us to understand how actions can be prioritised and the implications for new water resources that will be needed.** It will be vital to ensure that significant investments in new water assets or changing abstraction patterns address flow deficits where they are really needed, especially chalk streams. Bespoke solutions supported by the ideas and expertise of a range of delivery partners will mean that our collective efforts achieve the required outcomes rather than achieving immaterial improvements across broader areas or for lower priority habitats or river reaches.

We will continue to work with our members and stakeholders to identify what the water needs and priorities are at a local catchment level that will ultimately result in a set of geographically nuanced environmental need and Environmental Destination scenarios and timelines.



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## Subject to funding and supporting resources, we would advocate for the following further work:

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Develop catchment infographic-style PDFs or Power BI reports.	For local stakeholders to analyse the Regional Plan at a scale more relevant to them to help support investment decisions and/or identify future programmes of work. These could be built using interactive data visualisation tools that are being pioneered by the Essex Water Strategy. The Environment Agency has also published a series of <a href="#">groundwater abstraction maps for East Suffolk</a> catchments as part of the Water for Tomorrow programme.
Develop our understanding of specific catchments to the next level.	To help us identify the environmental outcomes we are seeking to achieve for specific waterbodies and habitats and explore and test in specific catchments the interventions best able to address the problem. Better understanding of the implications for different sectors and their current sources of water.
Quantify the volumes of water for lowland peat restoration in the WRE region.	Improve and expand the existing model of Water Level Management Plans (WLMPs). Support net-zero targets.
Chalk streams focus.	Develop further analysis of the abstraction pressures on chalk streams in the region and work with those leading the CaBA chalk streams work to share knowledge and consider project opportunities.
At a sub-catchment level, review our approach to deriving required abstraction reductions to meet the needs of water-dependent environments.	To support the development of more bespoke solutions that could maximise environmental improvement where it is most needed. This is particularly important for non-riverine habitats (such as wetlands), as well as chalk streams. Facilitate and engage with water company WINEP leads to ensure key links to regional planning are established.
Further develop WRE's Biodiversity Net Gain strategy associated with scheme development.	Building on WRE's Systematic Conservation Planning project and the work carried out in support of the Fens and Lincolnshire Reservoir projects. Ensure water-dependent habitats are a key feature of the new Local Nature Recovery Strategies being developed by lead authorities.



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# For farmers and growers

Eastern England is home to the majority of England's best and most fertile land, growing high value but also some highly water-dependent crops.

Hotter, drier spring and summer growing seasons mean more water will be needed to irrigate crops in the warming climate. 60% of England's irrigation licences are located in WRE's region, and our Regional Plan projects that water needs for irrigation could more than double by 2050 (from 190 MI/d today to between 264 and 479 MI/d by 2050).

**The sector is facing a number of urgent pressures, including high fertilizer and gas prices, water abstraction reform and the impacts from more extreme weather events (flooding as well as droughts).** It must also be recognised that drought impacts are more immediate for the agri-food sector compared with the water industry. Water companies routinely plan 25 years ahead for their water resources, and because of past investment, can maintain security of supply through multiple dry years. In contrast, the agri-food sector has much less supply-side resilience and often rely on direct abstraction from the environment. On-farm reservoirs, even where present, may only store water for one season or one crop cycle ahead. Climate change is increasing the need for additional storage. Otherwise, for some farmers, there is a risk that sufficient water will not be available to irrigate their preferred crop choices and the loss of abstraction licences could severely impact land values.

**The agriculture sector consists of thousands of individual farm businesses, which in the past had no formal means to collaborate on long-term water resource planning.** Water abstractor groups (WAGs) are enormously valuable in the few areas they exist (e.g. Norfolk, East Suffolk, Lark), but they do not yet have a clear timetable of future reductions in water availability and forthcoming licence restrictions upon which to meaningfully plan and invest. However, work now commissioned by the Water for Food Group, sponsored by Defra, the Environment Agency and the NFU, has started to address this. The work includes the development of template Water Resource Management Plans and Drought Management Plans for the agriculture sector. There is also now a national 'Super WAG' forum supported by the Environment Agency and the NFU.

**The agricultural sector plays an important role in managing the environment and is responsible for safeguarding important landscape features and providing habitats for wildlife of local, national and international importance.** Some types of land use can also play a positive environmental role by acting as a carbon sink. As well as decreasing its own environmental footprint, the agriculture sector is becoming an increasingly important provider of renewable energy for the UK economy, including wind power, solar power and energy produced from biomass.



**Farmers manage over 75% of land in the WRE region, providing substantial environmental benefits and ecosystem services.**



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## Abstraction licence changes

**WFD 'No deterioration' licence caps are beginning to be imposed.** These affect licences with headroom (unused water) that irrigators might have otherwise considered available to support growth plans and use during extended dry periods. These caps are being applied in catchments that have a risk of causing deterioration if headroom were to be fully utilised.

**As a minimum, such licences are likely to be capped to 'max peak' usage as measured over the period 2000-2015.** In over-abstracted catchments, licences may need to be capped at the much more challenging 'recent actual average' use. There are hundreds of licences in the WRE region that will need to be capped to avoid deterioration but, at present, the farm businesses are not aware of when this will take place and how much water they will lose, meaning they are unable to plan for these circumstances.

**Where abstraction is found to be affecting designated sites, licences may need to be reduced further or be withdrawn altogether.** Such is the case in the Ant Valley in Norfolk, for example, where licences held by approximately 20 farm businesses are due to be reduced or revoked by October 2024. Abstractors have 28 days to lodge an appeal from the date that a 'Section 52' (Water Resources Act 1991) notice of change to licence conditions is issued, and then typically a few years before the licence changes come into effect. The Environment Agency aspires to give six years' notice, but it can be considerably less than this in practice.

**For farmers, this puts huge uncertainty and risk into their operations as alternative water supplies, such as building new agricultural storage reservoirs, can take years to go through complex planning and licence approvals. There is no guarantee of such approvals being granted.**

**WRE's ambition to create a fully multi-sector plan has been hampered by a lack of funding within our Technical Programme to commission studies that look beyond the public water supply.** The second National Framework for Water Resources, due to be finalised in 2025, is likely to place added emphasis on multi-sector planning, including supporting the needs of agriculture. But at this stage, there is no guarantee of funding to allow regional groups to do this. This is unsatisfactory, as the water resources challenges for the agricultural sector are as pressing as they are for public water supply and work cannot wait until 2025 to be taken forward. WRE has requested interim funding from the Environment Agency so that we can make a start whilst long-term funding options are considered.

## Future work

Working with the National Farmers' Union and other relevant stakeholders, WRE would like to explore the long-term impact of licence caps and reforms on the agricultural and other non-public water supply sectors at a more detailed level, and support abstractor groups and others to bring forward catchment-based local water resource management plans within the context of our Regional Plan. Subject to funding, the table on the next page lists some priority areas.



**Although it covers less than 4% of England's farmed area, the Fens produces more than 7% of England's total agricultural production, worth £1.23 billion. The whole food chain, from farm to fork, employs 80,000 people and generates more than £3 billion a year for the Fens' economy.**

Source: NFU Integrated Water Management Strategy



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Future requirement for a multi-sector plan	Purpose
More detailed analysis of the Environmental Destination scenario implications for farm businesses at a scale of greater relevance to them.	<p>To support the agricultural sector's longer-term planning, to understand trade-offs within each catchment, and the most effective way of retaining water in the environment.</p> <p>We strongly advocate for a more formal integration of all sector needs in forthcoming public water supply-led WINEP investigations so there is a single process for identifying necessary abstraction changes for all sectors, and the most effective way of realising the environmental outcomes in each catchment.</p>
Work with abstractor groups and the Environment Agency to explore and assess possible scenarios for 'No Deterioration' licence caps.	<p>To increase clarity regarding the shorter-term risks to farm businesses and the actions that could be taken to increase long-term security in water supplies.</p> <p>To support an analysis of how far caps work towards the Environmental Destination scenario reductions, as the water companies have done.</p>
Update projections of demand and supply-demand balances for agriculture for each CAMS catchment, based on likely irrigation needs under a range of climate change scenarios, and the availability of water in ground and surface waterbodies for abstraction.	<p>To provide evidence regarding the scale of the challenge within each catchment and the corresponding scale of potential solutions (such as water storage).</p> <p>This work would also increase our understanding of the key pressures acting on agricultural water users and how they differ between catchments or between users. For example, those abstracting directly from rivers may feel the effects of climate change more acutely than groundwater abstractors, who may face greater pressure to reduce licences in order to retain more water in the environment.</p> <p>Work in this area was commissioned by Cranfield University in early 2023, funded by the Environment Agency, Defra and the NFU, and due to report this autumn/winter.</p>
Work with the sector to develop a clearer understanding of the reliability of water supply needed, and how this influences the nature of the planning problem and potential solutions within each catchment.	<p>Public water supplies are planned with a specific 'level of service' agreed with their customers and regulators; for example, the chance of severe drought restrictions being reduced to no more than 1 in 200 chance (1 in 500 chance by 2040) in any given year. Building resilience in supplies to be able to meet these levels of service is a key factor in water company investment.</p> <p>The agricultural sector collectively doesn't have a common resilience standard to work toward. Individual farm businesses make decisions on how resilient their water supplies need to be. Developing farm-level water resource management plans will help this process, using the template being developed and tested by the Water for Food Group.</p> <p>Further analyses may indicate where water use, or expectations of water availability, need to adapt. We will continue to work with the Environment Agency and the agricultural sector to further our understanding and the implications of this.</p>



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Future requirement for a multi-sector plan	Purpose
Development of a more structured option identification and screening process for the agri-food sector, akin to that used by the water industry to ensure potential scheme developers focus efforts on solutions suited to the planning challenge and characteristics of a given locality.	<p>To identify the potential for new localised as well as more strategic regional interventions to support multi-sector water resource needs and achieve the Environmental Destination for all sectors. This could include potential conjunctive use of public water supply options by farm businesses and other sector users.</p> <p>The work should also explore the possibility for agriculture supply-demand deficits to be bridged by other means including land-use change, drip irrigation and other water-efficiency measures (including vertical farming options), rainwater harvesting, effluent reuse, regenerative farming and other nature-based approaches, managed aquifer recharge, inter/intra-catchment transfers and winter storage reservoirs.</p> <p>A cost-benefit and funding/financing assessment for each of the above will be needed.</p> <p>Ministers committed at the <i>UK Farm to Fork</i> summit in May 2023 to make funding available to abstractor groups and other local stakeholders to support the identification of new local resource options. We hope regional groups will secure a share of this funding so that we can guide and support the process.</p>
Make better use of the multi-sector tools and models developed by WRE and our partners.	<p>To fill the gaps in our understanding of how regional 'strategic options' and catchment-based solutions work together as part of a more integrated plan.</p> <p>This will help us to work with the agri sector to estimate the overall level of investment and support that may be needed in different catchments for new reservoir storage and demand management schemes. This will be an important piece of evidence to present to Defra for its future policy development and funding bids to HM Treasury.</p>
Maximise learning from the Water for Tomorrow project and build on the project's legacy.	<p>Use outputs and the tools to prompt more focused action in response to catchment and sub-catchment level challenges for the agricultural sector.</p> <p>Increase understanding of how resilient different groups of water users within catchments are to potential licence reductions or changing weather patterns and how this could influence approaches to managing water resources at a catchment level.</p>



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## Policy asks

- Long-term security of abstraction licences to allow multi-year farm production planning and to support investment in new water supplies. For example, the business case for a circa 25-year investment in a reservoir cannot be built upon abstraction licences that include six-year review points as proposed under the new Environmental Permitting Regime.
- Funding and incentives to develop and grow abstractor groups, including where these are not already in place. This will allow the planning work to be undertaken at local level, directly with farm and other business abstractors.
- Adoption of policies that give farmers the confidence to take on debt and invest to make businesses sustainable and fit for the future.
- Streamlining of agriculture reservoir consent processes for both planning and abstraction licensing.
- Reassurance that rural livelihoods are considered a policy priority, and that the health, safety and welfare of the rural workforce and their livestock is taken seriously during drought events.





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# For the power sector

Power plants are major users of river water in the WRE region, mainly on the Trent and Great Ouse.

Whilst freshwater use by the power sector is projected to be small in 2025 (4 MI/d) compared with public water supply and agri-food, demand could grow by 140 MI/d within the region by 2050. This growth is linked to statutory targets for achieving net-zero carbon emissions and the need to decarbonise energy systems and transport. As a result of this target, new types of plant will need to be developed from the mid-2020s onwards to complement the continuing growth in renewable energy generation.

Around two thirds of current water usage by the power sector is not 'consumptive' but used and then returned to the environment close to the abstraction point. The third that is consumed is due to evaporation during the cooling process.

**Future water use by the sector is likely to be driven by the rollout of carbon capture, usage and storage (CCUS) and hydrogen production in order to meet the UK's net-zero targets.** The rollout of both technologies is uncertain at this stage, in terms of location, scale and timing. The best forecasts available come from Joint Environmental Programme (JEP) studies, using energy scenarios created by National Grid, the Climate Change Committee (CCC) and the Department for Energy Security and Net Zero. Based on the most recent and best data available, forecasts for water demand show:

- A continuing decline during the early- to mid-2020s as coal-fired power stations are decommissioned.
- Followed by potentially a significant increase in water demand from the late 2020s resulting from the cooling and process-water needs of new power and hydrogen production plants as energy systems adjust to the requirements of net-zero carbon strategies with increased electrification, use of hydrogen and hydrogen-using technologies.

At a national scale and over the period to 2050, the increase in water demand has been estimated to be in the order of 1,000 MI/d. In the WRE region, the South Humber Bank and the tidal Trent is expected to be the focus for hydrogen generation, although the potential exists for significant hydrogen production with CCUS in other areas of the region too.

The rollout of hydrogen and CCUS will be influenced by the government's national net-zero strategy, including whether hydrogen becomes a fuel for large-scale transportation systems (which will potentially require smaller, more local hydrogen systems) and the timing of any move toward the mass replacement of domestic gas boilers (which will be focused on large hubs). Further research is required to understand the dynamics and relationships between energy and water systems, and where freshwater will be sourced from to meet the demand for hydrogen and CCUS in the east.

**Power plants tend to optimise energy production rather than minimise water demand.** This is because trying to conserve water can have undesirable consequences for station efficiency and atmospheric emissions. However, a power station's Environmental Permit requires monitoring and review of resource efficiency. This includes efficient use of raw materials, including water, with a four-yearly review to determine if there are opportunities to improve resource efficiency. In 2003, the Joint Environmental Programme (JEP) produced a monograph called 'Using Water Well?' that considered the impact of the power sector's use of water on other water users and the environment.



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## Why hydrogen?

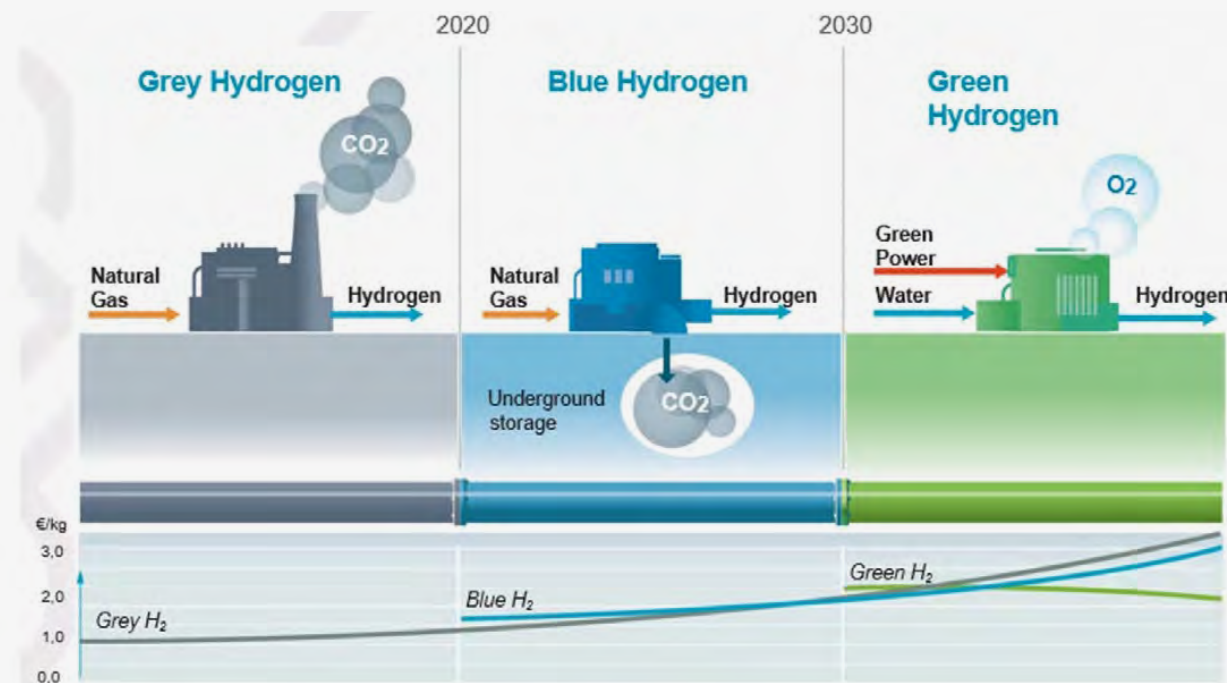
Hydrogen is seen as a key component of the UK's net zero strategy because its combustion does not result in CO<sub>2</sub> emissions. Low carbon approaches to hydrogen production therefore represent clean alternatives to natural gas and liquified petroleum gas. Hydrogen is the most abundant chemical element, estimated to account for 75% of the mass of the universe. The various means to produce hydrogen are referred to by colours:

- **'Grey' hydrogen** is currently the most common type and is produced using natural gas. The two main production methods are steam methane reforming and autothermal reforming. Both of these processes result in carbon dioxide. Grey hydrogen is therefore not considered a low-carbon fuel.

- **'Blue' hydrogen** uses the same process as grey hydrogen, but the carbon dioxide is captured and stored to achieve a lower-carbon fuel.
- **'Green' hydrogen** is produced by electrolysis, using electricity from clean energy sources such as wind and solar to split water into hydrogen (H<sub>2</sub>) and oxygen (O<sub>2</sub>). Green hydrogen has a much lower carbon footprint than grey hydrogen.

Figure A3.2: Methods of hydrogen production and projected costs

Source: tno.nl



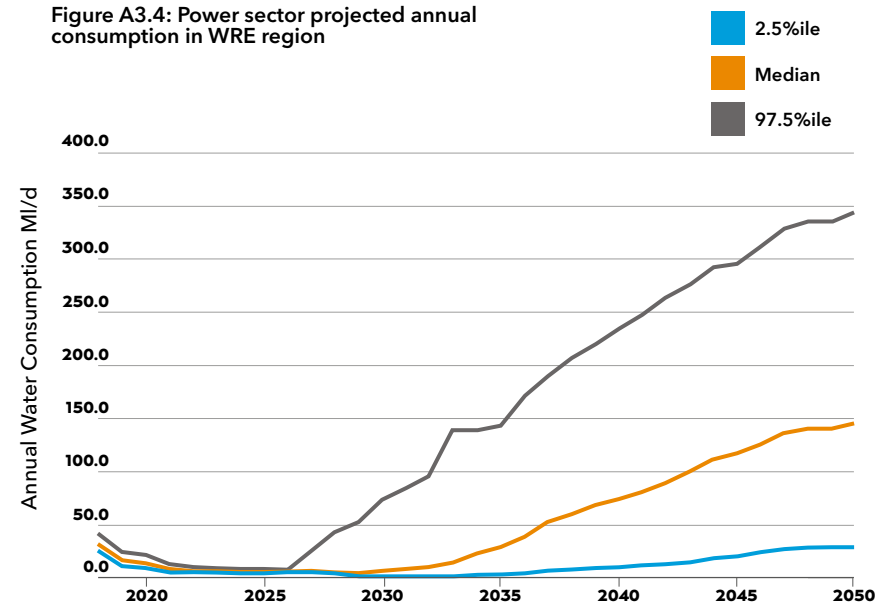
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**Figure A3.3: Proposed clusters for carbon capture and storage and hydrogen production from the mid-2020s**



**As the future energy mix is uncertain, projected trends are more important than specific numbers.** However Figure A3.4 below gives an idea of the potential water requirements in the region. These are based on FES21: the four future power scenarios produced by National Grid Electricity System Operator in 2021. Each of the four scenarios represents a credible pathway for the development of energy from today to 2050.

**Figure A3.4: Power sector projected annual consumption in WRE region**



Source: WRE analysis of Joint Environmental Programme data, 2022"



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## The power sector is different to the water sector:

- There are no externally prescribed investment cycles – these are asset and company specific decisions.
- It is highly competitive.
- There is international ownership and competition.
- Competition law prohibits certain types of collaboration between companies.

As a result, there is no power sector plan and consequently no sector plan for water. The sector is represented by Energy UK and the JEP. However, there is no company or body that can negotiate or 'trade off' on behalf of the power sector, due to competition law.

**While the power sector is not currently affected by the Environment Agency's licence capping and Restoring Sustainable Abstraction plans (largely as a result of the sector's remit to provide reliable energy for national security of electricity supply and services to the National Grid), there is potential for licence capping and abstraction reductions to be needed in the future.**

A power plant needs water abstraction licence certainty over its operating life (more than 25 years) in order to operate existing plant and to secure investment for new plant. A power station site lifecycle typically involves a high load factor and high water use in the early years of its life, but a lower load factor and lower water use in the latter years of its life.

When a power station is decommissioned, it is often replaced by a new station on the same site, which follows the same water-use pattern. Therefore licence capping does not fit well with a power site lifecycle as licence capping based on water use at an aging power station restricts the capacity of future developments, including low-carbon technologies. Licence reduction during a station's lifetime could render the station inoperable, resulting in a stranded asset.

**For power stations, there is a significant difference between availability of water on an annual basis and the reliability of an abstraction at a particular point in time.** Power stations operate 24 hours a day in a dynamic market with half-hourly trading of electricity. Unavailability of water for just half an hour can have an impact on both commercial performance and system security. If water restrictions coincide with a period of electricity system stress, particularly if several operators are affected simultaneously, there can be considerable impacts on electricity prices, as well as implications for system security.

**Water use for hydrogen production can be much more flexible and dynamic.**

As hydrogen can be stored, hydrogen production using freshwater could be reduced or even stopped during a drought, assuming sufficient hydrogen has been stored, without having an immediate impact on system security.

## Future work

Development of an action plan with power sector representatives to work through the myriad of uncertainties in future power and hydrogen production scenarios and the implications for water resources requirements in the east of England.

Further work to assess the power sector's part in delivering abstraction reductions to meet Environmental Destination targets.

Longer term, there is scope to look at options to co-locate desalination and hydrogen production as part of the rollout of renewables (particularly offshore wind) and new nuclear at Sizewell.



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## Policy asks

- Create greater long-term certainty for abstractors over the impact of forthcoming licence reforms. Ensure licence caps on existing assets do not compromise future investment and the UK meeting its net zero commitment. Currently, it is not clear if sufficient water will be available for energy sector developments in the WRE region, as the future location and scale of new plants are unknown. There is also uncertainty in future water availability given forthcoming abstraction licence reviews.
- Clarify water 'rights' for the life span of new and existing power assets to enable secure investment and contribute to the UK's net zero commitment. Future power and hydrogen production plants will require access to water and water rights for the duration of the plant's life (more than 25 years) to allow investment in new plants and to ensure electricity system security and decarbonisation in a resilient, efficient and affordable way. Increasing pressure on water resources, the move to time-limited abstraction licences, and potentially six-yearly reviews under the transfer of abstraction licensing to the Environmental Permitting Regime, all increase the uncertainty in water availability and therefore increases the risk for investors in low-carbon power projects.
- Provide regional groups with funding to facilitate multi-sector consideration and assessment of new supply options, including for energy and power production. Currently, there is no funding mechanism for joint research and development of water resources for all users.
- Provide the power sector with easier access to Environmental Flow Indicators on river reaches that are of interest, to make it easier for potential power project developers and investors to evaluate the site-specific risk of water unavailability.
- Find a long-term solution to ensuring that the energy sector has access to the water needed in the future to provide electricity system security and contribute to decarbonising the UK.





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# For the regional economy

**Rapid economic growth in Eastern England and growth in existing and emerging business and technologies over the coming decades is set to increase water demand for public water supply companies and locally within the region's catchments.**

With its easy access to international ports plus rail and road links, the east of England is an ideal location for business and industries relocating or setting up new operations. The region is home to three of the UK's five fastest-growing cities (Cambridge, Milton Keynes and Peterborough), the potential growth areas centred along the M1, A1 and M11 strategic roads, East West Rail, and the Cambridge/ Norfolk growth corridor.

**There are also emerging hydrogen clusters.** These developments are contributing nationally, regionally and locally to the economic success of the country, while at the same time increasing job opportunities. However, with this growth comes increasing pressure on water in an already water-stressed region.

**While the water companies in the WRE region have largely been able to offset growth through demand-management strategies implemented in the past, the lack of available water resources is now affecting growth.** Essex & Suffolk Water is having to decline requests for new or increased non-household water supplies in their Hartismere zone until new strategic sources of supply become operational.

Anglian Water considers new non-household connections on a case-by-case basis. In Cambridge Water's area, the Environment Agency has begun to object to some planning applications due to the risk of deterioration to waterbodies arising from additional water use.

A Water Scarcity Working Group as part of the [new Cambridge Delivery Group](#) has been established to consider how best to address this. In addition, nutrient neutrality has frozen development in large parts of Norfolk due to poor water quality in protected sites, and this could be extended to other areas. A water neutrality requirement is already affecting new development in Sussex and this could be extended to other areas where protected sites are at risk.

Housing growth and non-household industrial growth estimates are embedded in local government plans across the region, which could see up to 1.2 million new homes by 2050, as well as supporting other economic and strategic growth plans such as the Norfolk and Suffolk Economic Renewal Plan.

**From the feedback we received on the previous versions of our Regional Plan, it is clear amongst our members, in particular from local authorities, that water companies' WRMPs must provide confidence in the certainty and deliverability of their demand management proposals.** This evidence will be useful in the development of local authorities' own proposed policy in local plans to support highly water-efficient new developments. However, it is noted that government policy to reduce the impact of new development on water consumption through tighter building regulations is progressing very slowly. The Environmental Improvement Plan launched in January 2023 includes a 10-point roadmap to more water efficient new development, but without any specific timescales for its implementation.



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## Future work

Similar to the power sector, a gap analysis of what we already know versus what more we need to understand needs to be undertaken now that the first round of regional planning is drawing to a close. Such analysis includes future water needs in 2050, the key drivers for change and the subsequent pressures affecting access to water.

With the support of our local authority members, we also need to explore business and industry's role in delivering further abstraction reductions to meet Environmental Destination targets.

## Policy asks

- Stronger support by government and regulators for action by wholesalers and retailers to reduce non-household consumption.
- The new roadmap to water efficiency in new developments and retrofits in the Environmental Improvement Plan 2023 to be taken forward urgently, including to consult on tightening the water efficiency standard(s) in Building Regulations as soon as possible.
- Building control officers to increase their inspection and enforcement of water efficiency standards in new development and retrofits.
- Streamlining of the planning process for new storage reservoirs for the non-public water supply sectors, making the process easier for local authority planning departments as well as those in non-public water supply sectors trying to invest in future water supplies.





## For households and businesses

Our plan shows that the public water supply deficit from household and non-household use could grow to 730 MI/d by 2050 if no new demand-management measures or supply-side options are implemented.

It is imperative for all domestic and non-domestic water users in the region to take action and follow the examples set by other dry countries such as Australia, where average annual rainfall of just 470mm is similar to the levels in the WRE region of just 600mm on average per year. As well as increasing the availability of water, Australia is getting better at using less. Many products are rated and labelled for

water efficiency, with homes increasingly adopting water-saving features. These include showerheads that regulate flow and dishwashers that use just 12 litres of water per load. More than a quarter of Australian homes collect and store rainwater for domestic use, contributing around 177 billion litres per year to residential water supplies. Together with domestic wastewater systems that treat and reuse greywater from sinks and showers, these integrated water management systems take pressure off water company supplies for non-potable uses such as flushing toilets, washing clothes and watering gardens (source: Australian Bureau of Statistics).

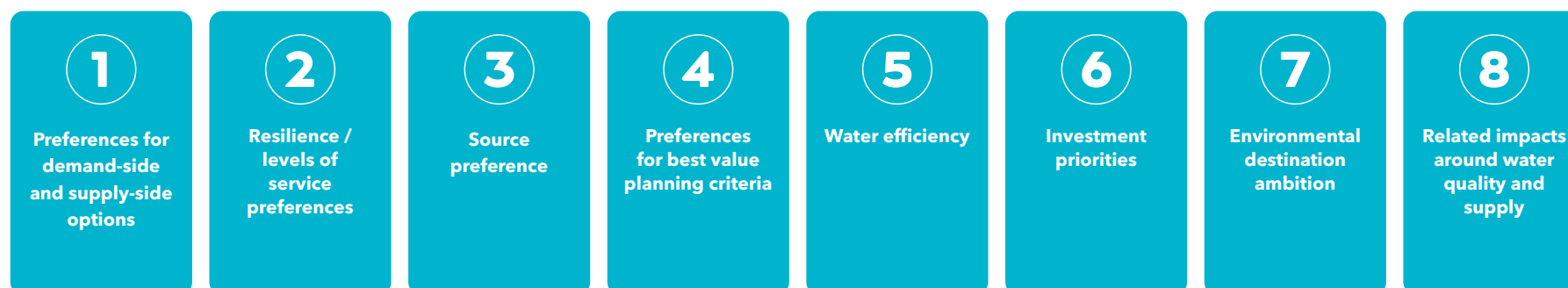
### Influencing the plan

**Water company customers have influenced our Regional Plan. Over the years, WRE's water company members have undertaken research with both domestic and non-household customers to help shape, influence and prioritise investment in demand and supply options. We commissioned a synthesis of recent customer research to inform our draft Regional Plan.**

In total, 47 pieces of research were individually assessed covering time period between February 2021 and June 2022. This included research conducted by WRE's four water companies, WRE commissioned stakeholder pieces of research, as well as some wider industry reports.

The key topics are split into eight areas. Four areas are highlighted in this section.

Figure A3.5: areas of customer research considered in our plan





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## Demand management

**Focusing on demand-management measures, and in particular, driving down leakage by water companies, remains the top priority mentioned by householders and environmental stakeholders, ahead of implementing new supply-side options.** Non-household customers are more supportive of both supply- and demand-side options, reflecting their high levels of concern about future water supply.

Universal (compulsory) metering as a demand-side option elicits mixed opinions. Customers tend to support universal metering as this is seen as the fairest way to pay for what is used, but there are some reservations around increasing costs for customers, particularly those with larger families.

## Supply-side options

**Reservoirs and water reuse are the most popular supply-side options, although business and industry users would also like to see more opportunities to invest in grey water recycling technologies.** The least popular supply options amongst water customers are desalination (due to perception of energy intensity, cost and taste) and transferring water around or between regions. However, energy sector stakeholders would like to see further consideration of innovative desalination technologies.

Managing the environmental impact of what water companies do is customers' top priority after providing clean water and treating wastewater. Most customers want water companies to provide the highest possible protection for animal and plant life and play their part in addressing climate change. Interestingly, saving water at home is not identified by customers as a priority activity for preventing climate change.

## Environment

**Customers are concerned about environmental issues, but there was no clear order of priorities.** Some of the issues mentioned are extreme weather events such as heatwaves and storms; flooding; micro-plastics in rivers; droughts; loss of animal and plant species; and river pollution. In terms of environmental ambition or levels of improvement for the environment, the majority favoured achieving good ecological conditions across all rivers and improving biodiversity in and around rivers and streams.

Whilst differing environmental terminology has been used by the water companies when surveying customers, the preference amongst the majority of customers most closely aligns to the 'Resilience' (BAU+) scenario. This is seen as a good compromise, and is considered feasible and more cost-effective than the 'Enhance' scenario. Nevertheless, WRE's Board still endorses the higher ambition described by the 'Enhance' scenario.

Overall, there was no clear preference between achieving environmental ambitions before 2040 or by 2050, but the majority thought that by 2050 would be an acceptable target. WRE's Board however would like to see the outcomes of the 'Enhance' scenario delivered as soon as possible.

## Drought

**There was generally low awareness of the sense of urgency surrounding drought resilience.** Many customers were unaware of drought permits. When presented with drought management plans, most customers considered them sensible.

Most customers across the region support the use of temporary use bans (hosepipe bans) in periods of dry weather to protect the environment and water supplies. However, customers found it difficult to decide between drought measures and investment in new infrastructure, but broadly favoured investment as a long-term strategy for water resilience. Drought permits are viewed more as a short-term fix.



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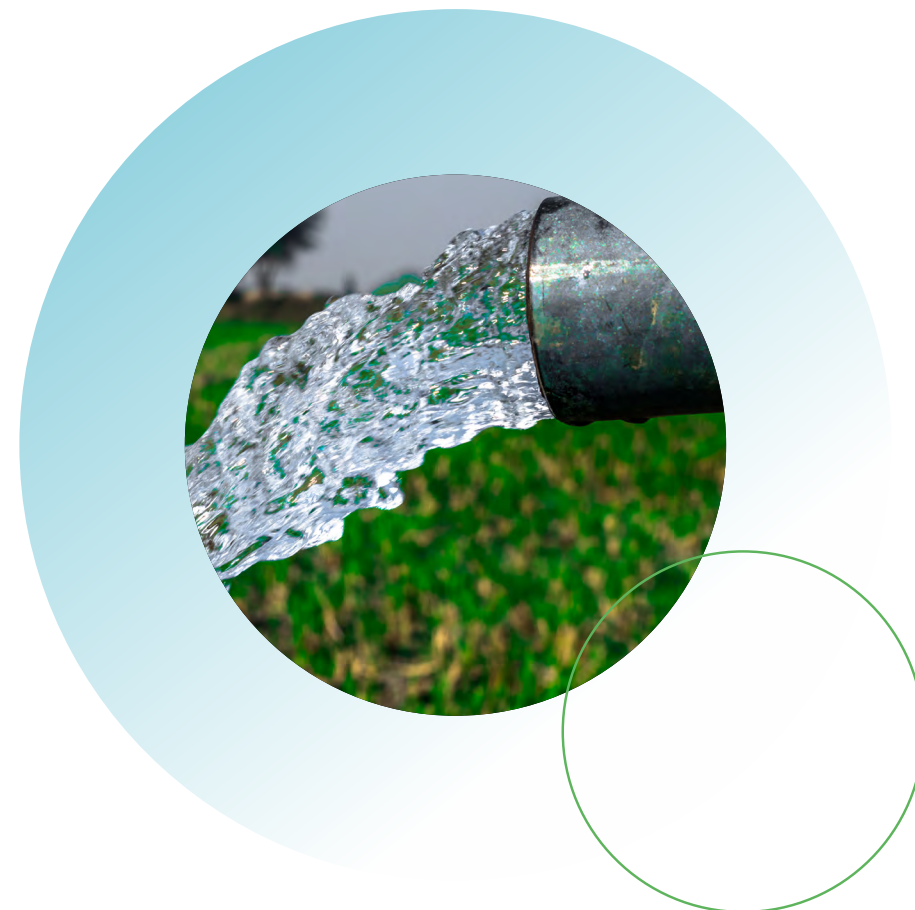
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## Future work

Future requirement for a multi-sector plan	Purpose
Work with water retailers and water recycling specialists to explore opportunities for reducing non-household demand.	<p>Explore the opportunities and barriers to mainstream uptake of rainwater harvesting and grey water harvesting systems for households and with non-household customers.</p> <p>Share and promote good-practice case studies for household and non-household water savings.</p> <p>Consider the potential for new innovation that may be available within the next five to ten years to reduce water demand</p>
Provide factual information and resources as we continue to develop our role.	For use by WRE's members and their respective members and customers to raise awareness of water issues in the region.
Continue to work with specific non-household sectors (e.g. leisure/golf) to reduce abstraction and demand for potable water.	To help water-intensive sectors use water more efficiently and build resilience to licence capping and future usage restrictions.





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# For internal drainage boards

Internal drainage boards (IDBs) are statutory bodies that play a fundamental role in managing water and flood risk in the east of England and are integral to the effective delivery of our Regional Plan.

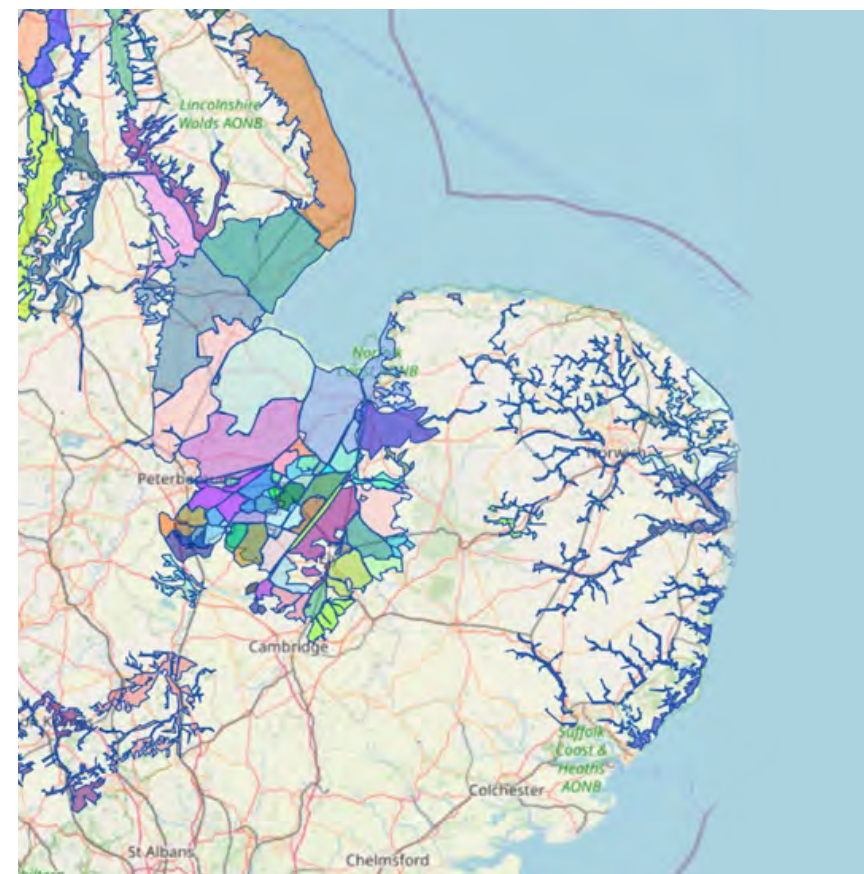
IDBs work closely with WRE, the Environment Agency, Local Lead Flood Authorities and water companies to plan and deliver water management schemes. The Association of Drainage Authorities (ADA) has a seat on WRE's Board to represent the IDBs in the region that contribute toward our running costs.

**IDBs serve low-lying areas across Eastern England, with objectives focusing on flood risk and water level management, and conserving biodiversity - each IDB is required to have a Biodiversity Action Plan.** The role of IDBs has changed in recent years from draining excess water from land for the purposes of food production and flood management, to increasingly taking, retaining and sharing water.

IDBs are able to move water around their districts during the year to support the water resource needs of agriculture, navigation and the environment. However, their mandate and funding for this is limited. The role of IDBs should be formally extended to add carbon and water resources management in the landscape to their existing powers and duties.

**The focus on integrated water management and the future role IDBs will play in this is of strategic importance.** IDBs already are, and will continue to be, instrumental in transferring water for all sector abstractors ensuring environmental, economic and community benefits and to support Water Level Management Plans (WLMPs). These WLMPs provide a means by which the water-level requirements for a range of activities within a particular geographical area, including agriculture, flood risk management and conservation, can be balanced and integrated.

**Figure A3.6: Coverage of IDBs districts in Eastern England**  
Source: ADA



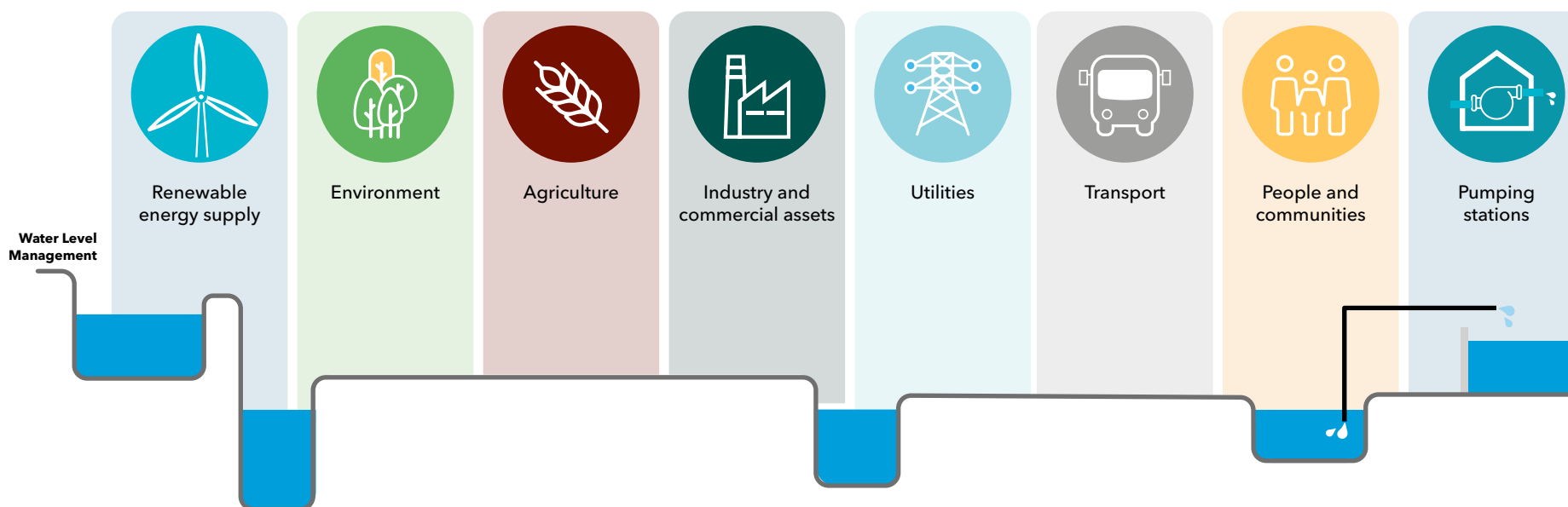
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**IDBs will also be integral as we move from identifying the strategic large infrastructure options identified within the Regional Plan, to focusing on more catchment-level local supply solutions that will complement and support the region's water needs in a more integrated way.** Storage of water, and in particular capturing the excess water from storms to be used in the more frequent and longer drier periods, will be a crucial element. As such, IDBs' role in retaining and sharing excess water will be a fundamental component of the Regional Plan going forward, requiring additional investment in the services they provide and the assets built and maintained to service this demand for storage.

There are many questions this change will bring, including: who will be responsible for managing the water supply provided by the storage of excess water, and the associated reservoirs, pumps and dams? What legislation will underpin this? And, lastly but more importantly, how will this all be funded? These are some of the areas WRE will be working on with IDBs, to help facilitate discussions and develop pathways to resolution.

## Policy asks

- New primary legislation to give IDBs wider powers and functions to contribute toward water resources management and carbon sequestration as part of integrated approaches to water management in the landscape. Currently, IDBs operate under the Land Drainage Act 1991 (as amended 1994) which provides no statutory underpinning for IDB's potential role in water resource management. IDB authorities have powers to build, operate and maintain pumping stations and associated water management infrastructure and pursue flood mitigation measures, but they do not have powers to store excess water to supply and facilitate trade with others, e.g. for power generation or irrigation.



**Figure A3.7: Beneficiaries of water level management by IDBs**  
Source: ADA

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## For navigation

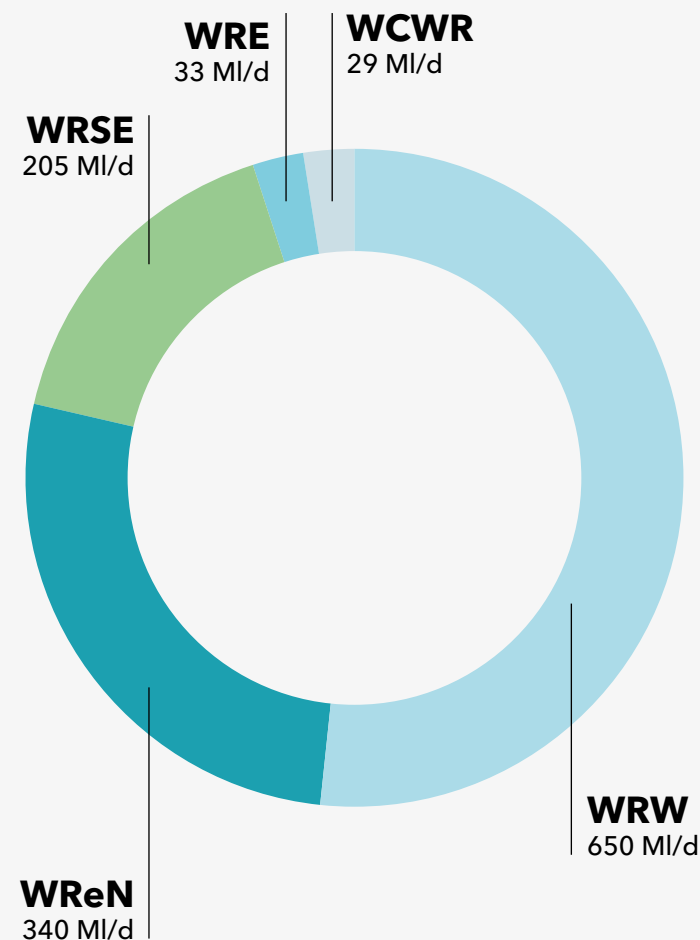
There are many navigation authorities within our region including internal drainage boards. The largest navigation authorities are the Broads Authority, the Canal & River Trust and the Environment Agency. Navigation authorities are responsible for looking after waterways, including maintaining locks and bridges, and managing water and sediment levels and flood risk.

Abstraction by the Canal & River Trust alone (33 MI/d) makes navigation the second largest non-public water sector abstractor in the WRE region. Canal demands for water are complex and abstraction supports environmentally-sensitive waterbodies and ecological needs, as well as statutory navigation functions.

**Eastern England has more than 600 miles of navigable waterways (the Broads Authority alone has 125 miles), which are integral to many current and future water-management strategies.** Water transfers along the canal network support several other business sectors, including the power sector, agriculture, housing and construction, pharmaceuticals and manufacturing. These water transfers can also support low-carbon heating and cooling.

We do not currently have a complete picture of current water abstraction to support navigation, nor projections of how this may change in future. We will work with the navigation authorities more closely in the next round of regional planning to better understand their immediate water scarcity pressures, their longer-term demands and the potential for new sources of supply.

Figure A3.8: Canal & River Trust average annual abstraction volumes over 2011-2017 by regional group area  
Source: Canal & River Trust



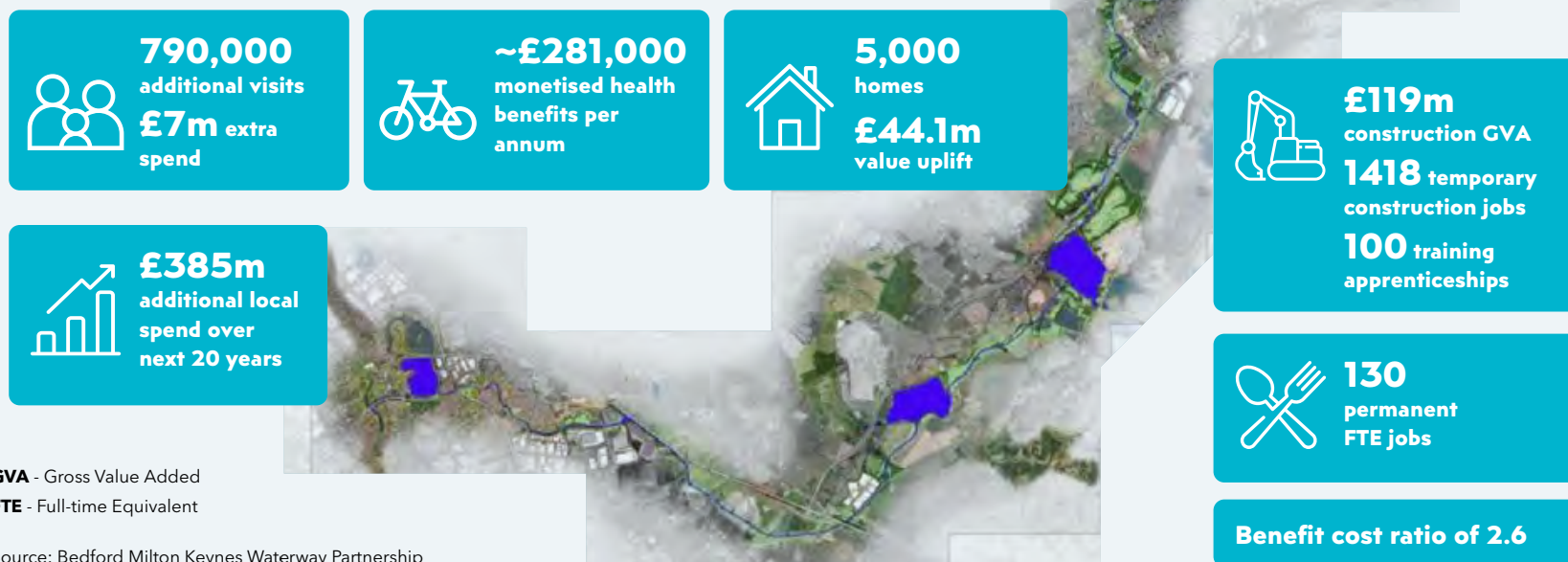
## The Bedford to Milton Keynes Waterway

The Bedford to Milton Keynes Waterway is a project sited in the Oxford to Cambridge growth area to develop a new waterway, within a multifunctional green corridor, linking the Grand Union Canal at Milton Keynes with the River Great Ouse in Bedford. This project offers the potential for a multi-beneficial, nature-based water transfer solution.

### Potential benefits

- Improved water resilience across the Oxford to Cambridge growth area and the Anglian region, improved local flood risk management and opportunities for water transfer between regions.
- Improved connectivity between existing rivers, canals, waterbodies and wildlife corridors.
- Increased natural capital and biodiversity.
- A context for sustainable and healthy new communities through creating a strategic sense of place.
- Increased opportunities for healthy living and recreational activities.
- New accessible waterside environments and green space and routes for cycling and walking.
- Offset impacts of hard infrastructure required to support growth.

**Figure A3.9: Bedford to Milton Keynes Waterway**  
Source: Bedford Milton Keynes Waterway Partnership



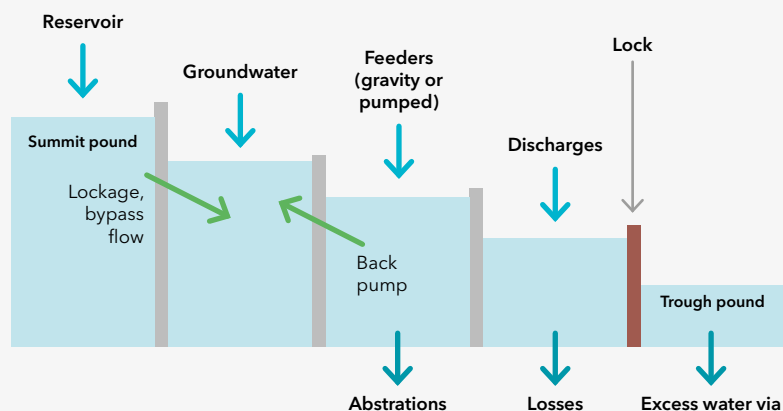
**GVA** - Gross Value Added  
**FTE** - Full-time Equivalent

Source: Bedford Milton Keynes Waterway Partnership

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**Navigational waterways managed by the Canal & River Trust have until recently been exempt from requiring abstraction licences to cover their water use because of their status as a navigation authority.** However, under the Environment Agency's new licensing regime, many surface water sources will become licensed.

**Figure A3.10: Schematic of water resource requirements and losses for canal and navigable river systems**



**The Environment Agency has begun issuing the first batch of Canal & River Trust licences.** The licences apply to flow control structures, mainly weirs and sluices, that are in place. They may also have conditions on the amount of water that can be taken and when in order to protect the environment. For example, in times of drought, the Trust may be issued with a 'hands-off flow' (HOF) order to stop all abstraction at a site. A handful of HOFs were triggered in the summer of 2022, but none directly resulted in the need for drought measures (such as lockage restrictions or canal closures). As the Trust has never had its abstraction restricted before, this will be a new consideration in its work at the licensed sites.

## Future work

Work will continue with the Bedford and Milton Keynes Waterway Trust and executive board to help build the business case for investment in this new strategic link. Specifically, WRE has been leading a project with the Environment Agency to assess the water resources and flood risk management benefits that the link could unlock.

New navigable waterways are also being considered elsewhere in the region, including the possibility of bringing back to life a section of a historic canal in Stamford, to support the [Boston to Peterborough wetland corridor](#).

We will also be working with the Canal & River Trust to understand new licensing requirements and their impacts on the navigation sector.

Future requirement for a multi-sector plan	Purpose
Bedford to Milton Keynes Waterway.	Continuation of work with the consortium to build the business case for investment in a new strategic waterway link.
Stamford Canal Society.	Work with Stamford Canal Society to understand the feasibility of restoring the historical Stamford Canal to help transfer water as part of the Boston to Peterborough wetland corridor.
Quantify the future demand for water by the navigation sector.	Understand and incorporate the drivers of change (e.g. drought resilience, climate change, changes in boat traffic) into our demand modelling for analysis and influence on future iterations of our Regional Plan.



## Regional Water Resources Plan for Eastern England

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