water industry forum

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INFRASTRUCTURE PLANNING

This paper shares insights on infrastructure planning for the water sector based on Sharon Darcy's address at the Water Industry Forum Annual Dinner held on 25 September 2024.

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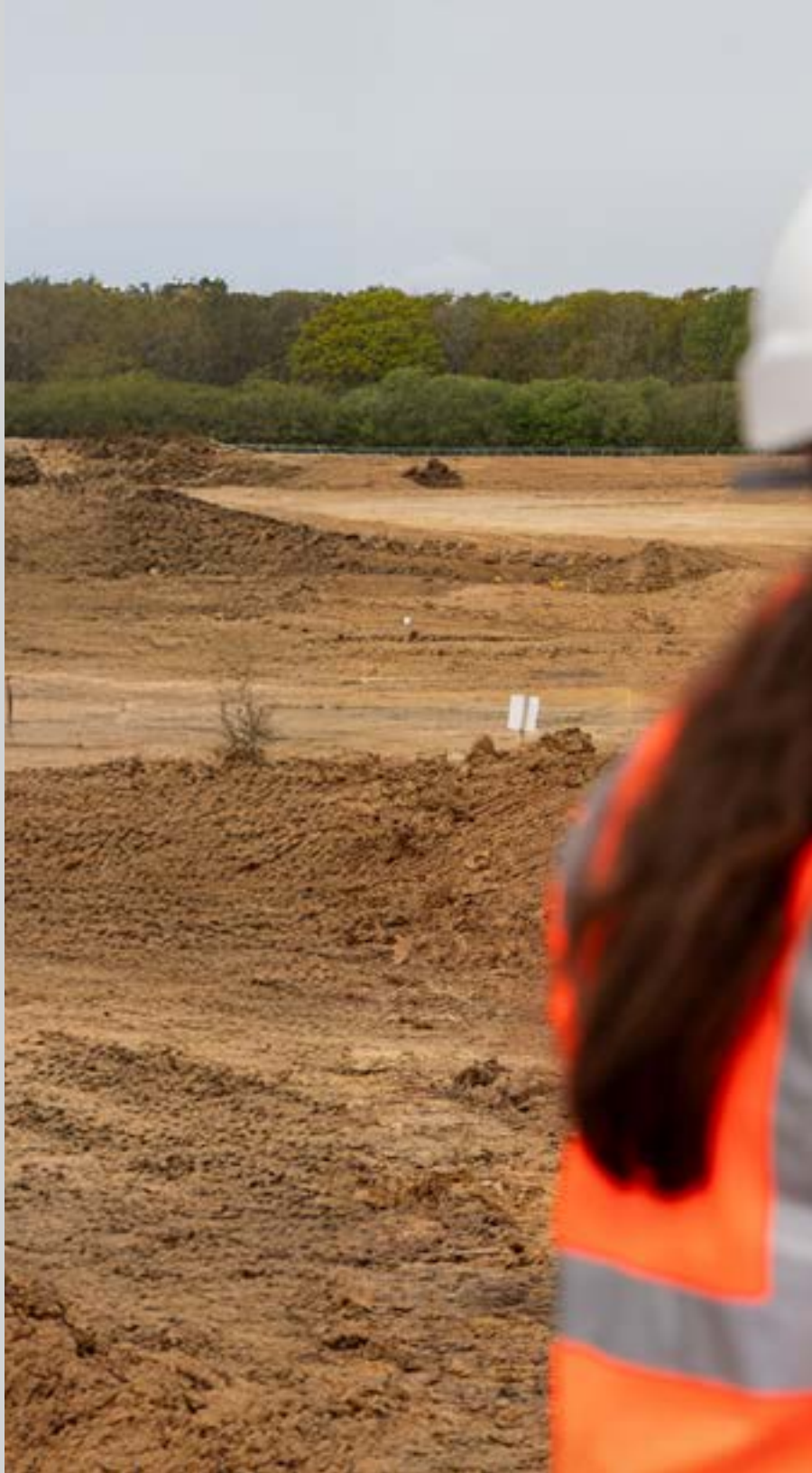
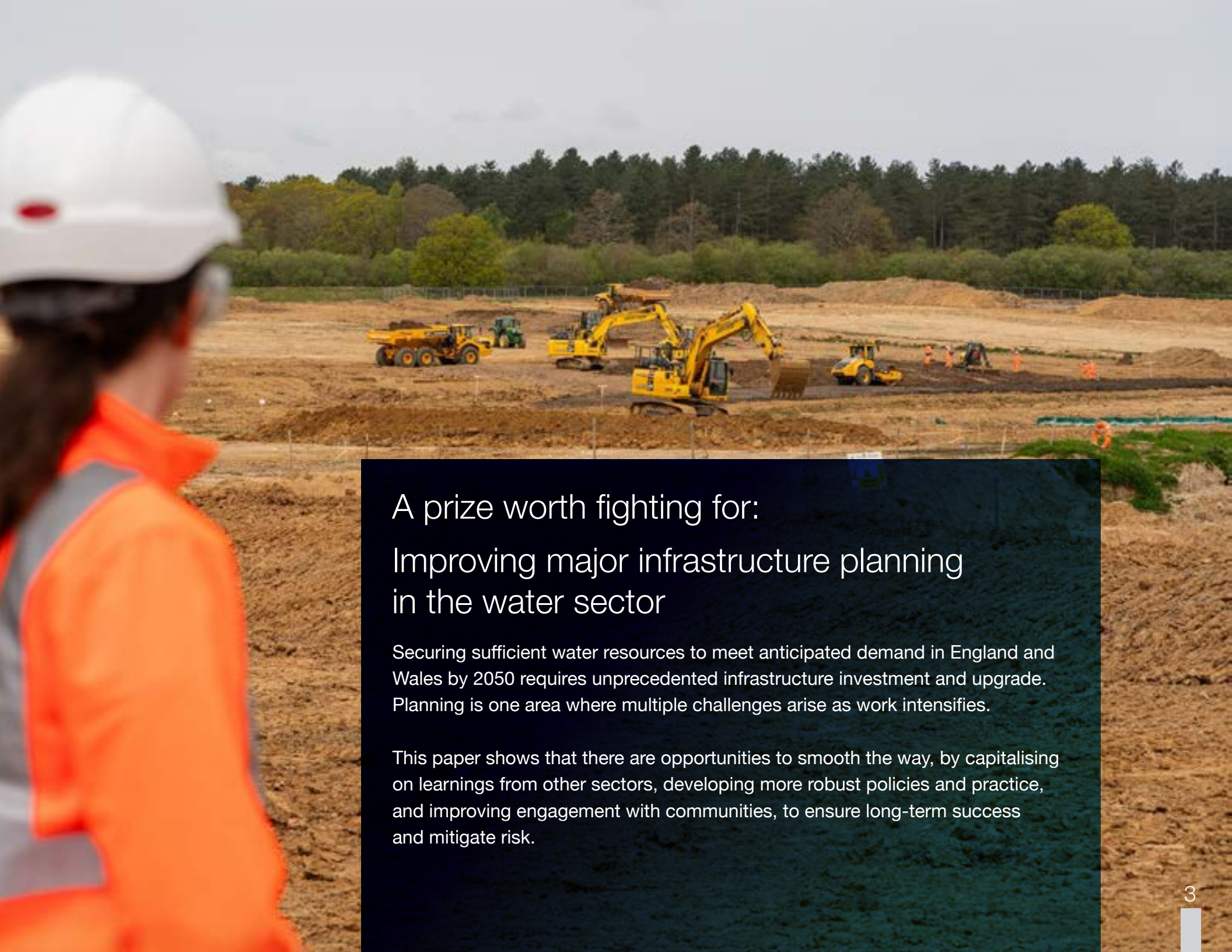




A prize worth fighting for:

Improving major infrastructure planning in the water sector

Securing sufficient water resources to meet anticipated demand in England and Wales by 2050 requires unprecedented infrastructure investment and upgrade. Planning is one area where multiple challenges arise as work intensifies.

This paper shows that there are opportunities to smooth the way, by capitalising on learnings from other sectors, developing more robust policies and practice, and improving engagement with communities, to ensure long-term success and mitigate risk.

Overview

England and Wales is facing a major challenge on water resources. By 2050, an extra five billion litres of water a day will be needed in England alone. That is on top of the 14 billion already being used.[1] To help deliver this, the water sector is experiencing the largest investment programme in at least a generation.

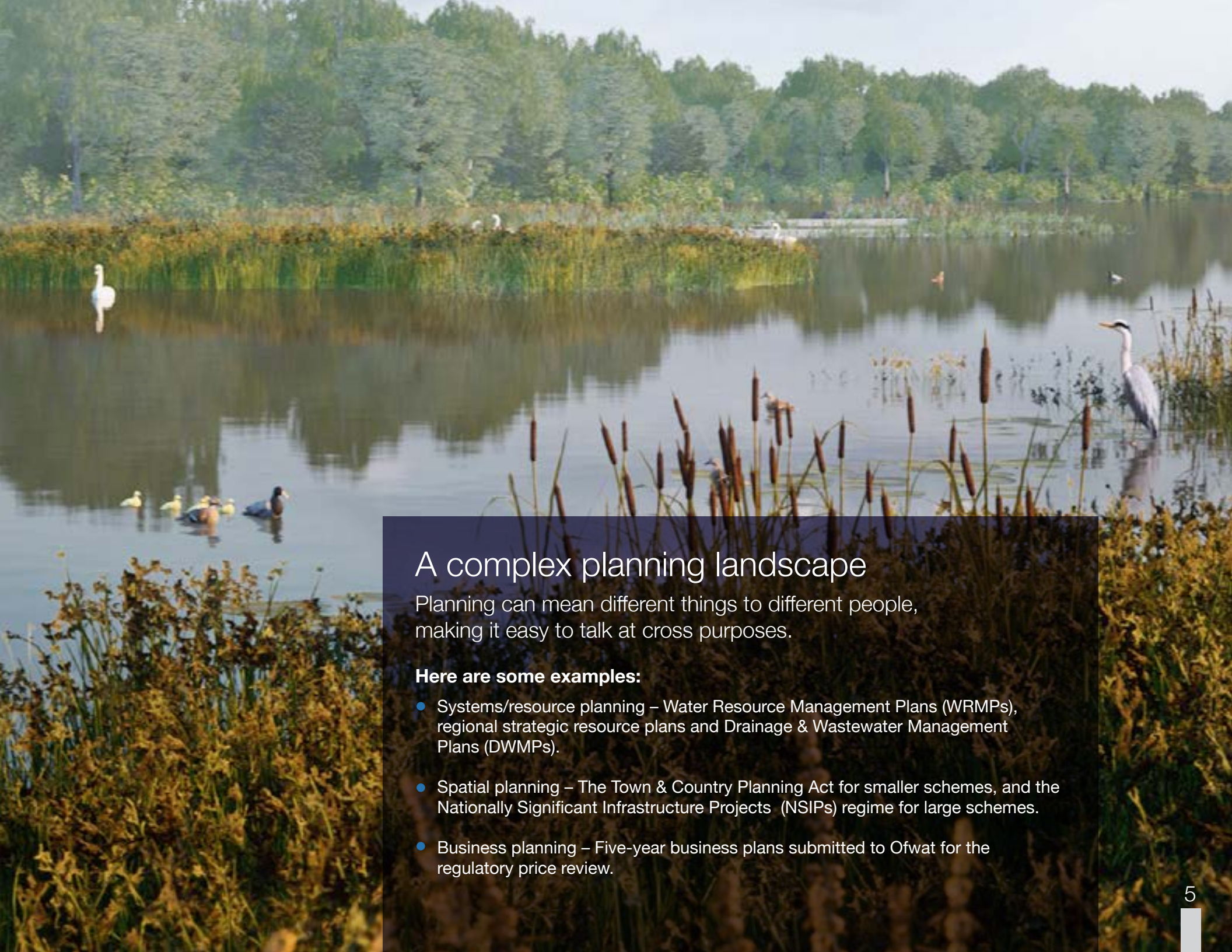
Driven by environmental requirements, population growth and the need to replace ageing assets, the final determinations of Ofwat's latest price review - PR24, amounts to £104 billion investment for the period 2025-30 alone. This is a true step-change, quadrupling investment in new infrastructure and resources in the sector.

It includes 30 major infrastructure schemes, including nine new reservoirs, nine large scale transfer schemes and 12 water recycling projects.[2] This trend is set to continue. Over the next 25 years, the sector expects to deliver an enhancements programme roughly three times as large as its current value.[3]

Getting the planning of this new investment 'right' is vital for customers and communities and will help address growing environmental concerns. It is also important for growth.

Lack of water is already limiting housing and business development in parts of Sussex, Cambridgeshire, Suffolk and Norfolk,[4] leading to the Environment Agency objecting to plans for a new hospital in Cambridge.[5] This makes the creation of additional resources, and the significant expenditure required, of considerable interest to investors and businesses, especially those in the water supply chain. It is truly a prize worth fighting for on all fronts.

This paper outlines some of the challenges that the water sector currently faces in terms of infrastructure planning. It then identifies some quick wins and potential areas to take forward longer term to address these.



A complex planning landscape

Planning can mean different things to different people, making it easy to talk at cross purposes.

Here are some examples:

- Systems/resource planning – Water Resource Management Plans (WRMPs), regional strategic resource plans and Drainage & Wastewater Management Plans (DWMPs).
- Spatial planning – The Town & Country Planning Act for smaller schemes, and the Nationally Significant Infrastructure Projects (NSIPs) regime for large schemes.
- Business planning – Five-year business plans submitted to Ofwat for the regulatory price review.

Planning challenges for the water sector

The water sector faces three key challenges on planning, which are all interconnected. They revolve around fragmentation of the system, attractiveness to investment, and public acceptance.

1

A system no longer fit for purpose

Getting major projects through the complex planning landscape is a significant challenge. For example, the reservoir being planned in Oxfordshire - the South East Strategic Reservoir Option - was first proposed by Thames Water 19 years ago.

The planning system is fragmented and has struggled to cope with wider systems and strategic spatial issues, or to respond to change. It does not sufficiently consider the interdependencies between water and energy planning. This matters, as new sources of water, such as desalination plants, are energy-hungry, and water is used for cooling in power plants and for production of new fuels such as hydrogen.

This issue was brought into sharp relief in Europe in 2022 where lack of water led to nuclear power plant shutdowns.[6] Cross-sectoral nexus issues are also found in spatial planning, where limited join-up has led to some schemes competing for the same land.[7]

The current disjointed system also does little to enable the shift towards integrated water management or better alignment between water and wastewater planning. With the need to restore our ecosystems, and the growing use of recycled water, this becomes increasingly important.

Issues with the spatial planning system in the UK go even deeper than this. The system is still largely non-digital. It is slow. There are significant shortages in capacity and capability within local authorities, wider statutory consultees and across the supply chain. It is also important to note that there is limited recent UK experience of planning for major water infrastructure projects to draw on – Thames Tideway and Havant Thicket Reservoir aside.

Many of the above issues have now been recognised and are starting to be addressed. Sector regulators have been working closely together on 28 Strategic Resource Option (SRO) schemes[8] through the Regulators' Alliance for Progressing Infrastructure Development (RAPID),[9] although there are also around two thousand smaller projects outside this that need to be delivered. Significant spatial and infrastructure planning reform is also in train.

2

Investability of the sector

To attract the investment needed in the water sector, the industry needs to compete in international markets, and capital can go elsewhere. In water, the Organisation for Economic Co-operation & Development has identified a funding gap for new infrastructure of US$6.7 trillion to 2030,[10] to keep up with growth and address climate and environmental impacts. Some of the places where this is needed may be willing to pay higher returns than the UK.

The energy sector also has a significant investment programme to deliver net zero. In the UK, this has been estimated as between £280 - £400 billion for new generating capacity up to 2037[11] and around £60 billion for new energy networks cumulatively to 2030.[12] Taken together, this dwarfs the UK water industry spend.

This is a competitive and challenging market in which to raise UK water project finance. This backdrop has been made tougher by PR24. Although Ofwat's final determinations have increased allowed investments compared to the earlier position, it has still reduced costs overall left a gap in allowed expenditure of £8.3billion compared to company proposals.[13]

The legislative reform programme for both water and planning more generally, in the short term at least, is also increasing uncertainty adding to strategic, programme and project risk. This all makes the task of attracting the approximately £7 billion of new equity and £45 billion of new debt required for the 2025-30 asset management plan – AMP8,[2] even tougher.

3

Public acceptance of new schemes

Persuading the public of the need for new infrastructure and the importance of installing it in a particular place can be difficult.

Generally speaking, people are not prepared for the level of infrastructure development coming - from both water and energy, nationally and locally. Politicians, driven by short-term electoral cycles, have been reluctant to speak openly about the counterfactual issues arising from non-action and the trade-offs faced. They have struggled to address the cumulative impacts of projects in certain areas and how to deal with questions of fairness around infrastructure that delivers national benefit but has limited local value.

Public engagement in individual projects can also be a challenge. In the wider infrastructure space, there are concerns that engagement has often happened too late - once options have already been decided. Engagement and communications work has not always been sufficiently integrated with undertakings on the demand side, for example, to conserve resources or develop nature-based solutions, making the public more reluctant to support supply-side changes.

The water sector's reputation is at an all-time low. Persuading stakeholders that companies can be trusted to build new infrastructure, so that they do not object to planning decisions and increase project risk further, is a delicate but necessary task.

Stepping up to the challenge

Although change is afoot and lots of good work is going on to start to address these issues, the water sector is some distance from where it needs to be.

Given the scale of the challenges outlined, it is perhaps self-evident that the sector and its stakeholders cannot just keep doing things the way they have always been done.

All sides need to come together to develop new ways of delivering infrastructure. The short-and medium-term actions on the next page outline how this might be done.

Quick wins on RAPID projects

The Regulators' Alliance for Progressing Infrastructure Development (RAPID) is a partnership between the Environment Agency, Ofwat and the Drinking Water Inspectorate that works with water companies to develop appropriate water resource infrastructure at a reasonable cost. While already facilitating project delivery, there is more that could be done to ensure even better delivery and outcomes on this large-scale infrastructure.

1

Look outwards

Although place and context are vital in spatial planning, there is much that can be learnt from elsewhere. For example, learnings for water from GB energy include:

- **Better spatial planning** – The energy sector has used sophisticated technical modelling for many years, but has found that deploying it as a near stand-alone activity does not translate to securing new infrastructure where it is needed, for example, in East Anglia. As a result, the National Energy System Operator has been tasked with developing a strategic spatial energy plan. The water sector needs to ask how can the great work on the WRMPs, regional water resource networks and elsewhere better consider spatial issues at a sufficiently early stage? Further, who should hold the ring for water strategic spatial planning?

- **Supply chain** – Following growing concerns around the ability of the energy supply chain to deliver net zero, the Government is now establishing a Supply Chain and Workforce Industry Forum and has agreed to maximise domestic opportunities for clean energy supply chains and boost awareness of associated job opportunities.[14] In water, what similar measures could be taken so that the sector is ready to deliver, and not at a disadvantage?

- **Strategic communications** - Stakeholders have learned that treating energy projects in isolation, rather than as part of a wider portfolio of projects, can reduce efficiency and make it more difficult to prepare the public for change. As a result, energy stakeholders are launching strategic communications campaigns. Could similar initiatives be helpful in water?

- **Community rewards** - In energy, community benefits payments are being used to compensate communities for hosting infrastructure that is in the national interest. These are not universally welcomed, with accusations of 'cash for pylons' sometimes levied at the sector. The water sector can learn from this experience.

Gathering and sharing such lessons does not happen automatically. Mechanisms are needed to facilitate knowledge sharing. The Linear Infrastructure Planning Panel (LIPP)[15] provides an example of how this can be done.

LIPP was set up to identify good practice in the use of new technologies and approaches in infrastructure planning. An independent collaborative engagement mechanism, it brought together NGOs, community networks, planning and data experts with representatives from government to develop proposals to support the use of new tools that can help infrastructure be delivered faster, greener, in the right places and with greater community acceptance.[16]

Going forward, an offshoot of LIPP, the new Smart Permitting International Forum, will act as a vehicle to share global experiences of what works and what does not, enabling practitioners to build collaborative networks and learn from others.

2

Secure meaningful engagement

Meaningful engagement needs to happen early and throughout a project's life. Digital tools can provide collaborative platforms to share project information and community inputs on an ongoing basis and in real-time. They can also enable project developers to reach groups that might otherwise be excluded from engagement activity.

All this is vital for an iterative and responsive approach to stakeholders and to mitigate the bumps in the road that many projects experience. Tools like Future Fox[17] and View City[18] are already used in the local planning world and can be adapted to address challenges faced in water projects, in partnership with stakeholder engagement specialists, like Stuttgart-based creative agency Die Wegmeister.[19]

Digital technologies need to be complemented by enhanced face-to-face deliberative engagement approaches, which empower communities and build on local knowledge and expertise, for example, citizens assemblies. Shared vision led approaches, such as that used for Hinkley C,[20] if introduced sufficiently early in the process, can help in the co-development of new projects, and cement the long-term relationships that will be needed to deliver them.

Importantly, they can also help maintain a compelling narrative as to why a project is being carried out and the outcomes sought during lengthy project lifecycles. In this way, they can help build and maintain consensus and help reduce party political positioning on the project over electoral cycles.

3

Explore options and manage uncertainty

Given the UK's limited recent experience in planning for major water infrastructure projects, and the optimism bias that can often exist in major projects, the risk of errors needs to be managed. Globally, it is estimated that 13% of water projects have cost overruns, with a mean overrun of 124 percent.[21]

Ensuring that early assessments include a wide range of options is vital, if projects are to remain focused on service needs and value for money.[22] New planning tools and approaches can help improve options assessment and manage uncertainty.

Artificial intelligence (AI) powered tools, such as Optioneer,[23] can enable much earlier identification of alternatives in a strategic spatial plan, portfolio of projects or within a given project itself. These can be adjusted to take onboard social and environmental factors and be used with communities to explore options at an early stage in decision-making. In this way, they can help project leaders 'think slow and act fast'.

New predictive and forecasting tools can help better address systems issues and get a better handle on costs and schedules, overcoming biases, driving efficiency and increasing certainty. For example, the use of linked digital twins can help increase understanding of how different initiatives will impact on an area or system. The use of scheduling and forecasting AI, such as nPlan,[24] can lead to more accurate costing and reduced long tail risk.

Actions for the medium-term

Sharpening policy, sharing data and developing an open learning culture can all bring broader benefits to planning and procurement in the medium-term.

1

Shape policy and regulatory frameworks

The water sector's policy and regulatory environment is in a state of flux. The Independent Water Commission, is considering water strategic spatial planning, along with wider sectoral issues. Revisions to the National Planning Policy Framework and the new Planning & Infrastructure Bill recently introduced to Parliament, to address broader planning challenges, are also in train.

The sector needs to embrace these changes and contribute its expertise to the reform programme to help ensure that AMP9 – the asset management plan period ending in 2035 - ends fragmented, siloed and cyclical decision-making.

Successful reform will depend on the development of a longer-term, integrated and coordinated approach that addresses fundamental issues, rather than adding more layers of complexity to the existing patchwork of measures. It will look beyond the water sector to address nexus issues, particularly between water and energy, and develop consensus on how trade-offs are dealt with. It will also bring spatial and water resource planning closer together, from the strategic, to the project level, and will facilitate integrated water management.

2

Share data and create effective data-sharing infrastructure

The current planning system does not facilitate data-sharing, particularly for environmental impacts. There is a significant opportunity for the industry to work with others - in the water sector and beyond, throughout AMP8, to develop new data-sharing infrastructure that gives greater access to the planning data required by all stakeholders, and that will be needed to build robust infrastructure.

This requires collaboration to ensure that this captures the issues and impacts that are important to communities and the environment, as well as engineering and cost information. Working with communities and citizen scientists to develop local or expert datasets to fill in any data gaps can also be a useful way to build support for projects.

Where possible and appropriate, planning data needs to be developed in a consistent and standardised way. It needs to be as open as possible, but as secure as necessary, so that it is not collected multiple times for the same project or area of work, but is sufficiently secure to minimise cyber security breaches and related risks. The work being done by the water sector under the Stream initiative[25] provides a good foundation for this.

3

Develop cultures and procurement processes that support change

To build trust in new ways of doing things, it is important to consider assurance processes, governance and culture. Whether Ofwat's focus on increased reporting and assurance in the PR24 final determinations support change, and the push for streamlined planning and growth, remains to be seen.

An open learning culture can help facilitate the uptake of new planning tools and approaches and encourage leaders to carryout thought experiments and 'what if' exercises with them.

New infrastructure planning technologies and methods clearly need to be trialled and tested to build confidence. However, new approaches will not be able to fulfil their potential if procurement processes and budget lines are still structured around old ways of working.

The supply chain and water companies need to work together to review procurement policies so that these enable new transformational approaches to be used that can develop new markets and more efficient and effective ways of doing things. When there are concerns, existing frameworks, such as the consenting process, can be used to provide assurance to address risks in this area and to ensure these approaches become the new business-as-usual.

Realising transformative change

Achieving change in areas like water infrastructure is complex and unavoidably political - with a small and large 'p'. There are significant collective action problems and vested interests on all sides.

To move forward requires multiple parties to realise that they cannot achieve transformational change on their own or through adversarial processes. They need to continually collaborate; developing new ways of thinking about, and incentivising, the right behaviours and actions.

Sounds too difficult? The short-term actions outlined in this paper are only the start, but perhaps being optimistic and keeping one eye firmly on what the water sector needs to look like in 2050 is the first key step.

About the author

Sharon Darcy is Chair of the Smart Permitting International Forum and the Linear Infrastructure Planning Panel. She is a Non-Executive Director of Portsmouth Water, which is building the first reservoir in the Southeast for three decades. She was previously CEO of think tank Sustainability First. The views in this paper are personal and do not necessarily represent any of the organisations with which she is associated.

Mention of specific technologies and organisations does not infer endorsement.

About the Water Industry Forum

The Water Industry Forum (WIF) tackles challenges facing the UK water sector through thought-leadership and facilitated collaborative working. It provides a neutral space that enables multiple stakeholders to come together to share ideas and develop solutions. WIF operates as an independent subsidiary of British Water - a cross-sector membership organisation that provides leadership, support and best practice for the UK water sector, and helps address the challenges faced by the sector.

[1] The Environment Agency, **A summary of England's revised draft regional and WRMPs**, December 2024

[2] Ofwat, **Our Final Determinations for the 2024 price review: Sector Summary,** 19 December 2024

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[11] National Audit Office, **Decarbonising the power sector**, 1 March 2023

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[15] More information about the Panel can be found on its website **Linear Infrastructure Planning Panel**. The Panel was kick started by **Continuum Industries**

[16] LIPP, **Delivering net zero, resilience and nature recovery: How new tools and approaches can transform infrastructure planning**, March 2024

[17] **https://www.thefuturefox.com**

[18] **https://www.vu.city**

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[22] ICE, **Enabling better infrastructure**, website accessed on 13 December 2024

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[24] **https://www.nplan.io**

[25] **https://www.streamwaterdata.co.uk/pages/about-stream**