

UUW47

Deliverability - Capital Delivery and Supply Chain

October 2023

Chapter 8 supplementary document

This document describes how we have prepared ourselves and our supply chain for the delivery of our AMP8 programme. We explain the opportunities that our programme provides for our customers, communities and the environment as well as for our own business and that of our supply chain. The document explains what we are currently doing to deliver our early start programmes and how this supports further growth for successful delivery throughout AMP8 and beyond

Contents

| | | |
|-----------|--|-----------|
| 1. | Deliverability – Capital Delivery and Supply Chain | 3 |
| 1.1 | Key messages | 3 |
| 1.2 | Structure | 3 |
| 1.3 | Overview | 4 |
| 2. | AMP8 ambitions and opportunities | 6 |
| 2.1 | We end AMP7 in a strong position | 6 |
| 2.2 | We recognise that AMP8 will bring change and opportunity..... | 6 |
| 2.3 | From long term planning to meeting the deliverability challenge | 7 |
| 2.4 | The 3Cs approach: Challenge, Capability and Capacity | 8 |
| 2.5 | Key deliverability tests | 8 |
| 3. | Identifying the challenges of our AMP8 programme | 10 |
| 3.1 | The context of our work in AMP8..... | 10 |
| 3.2 | Independent challenge of our WINEP build..... | 10 |
| 3.3 | Identifying and mitigating key programme risks | 11 |
| 4. | United Utilities and its partners in AMP8..... | 16 |
| 4.1 | United Utilities’ transformation programme for AMP8..... | 16 |
| 4.2 | A new Programme Management Office | 17 |
| 4.3 | Robust resourcing and engagement strategy..... | 18 |
| 4.4 | United Utilities' internal capacity and capability needs for AMP8 | 18 |
| 4.5 | New, dedicated teams for growth areas | 21 |
| 4.6 | Thinking local, acting local and building local partnerships..... | 22 |
| 5. | Engaging, expanding and building the supply chain | 25 |
| 5.1 | Understanding and assessing our supply chain risk..... | 25 |
| 5.2 | Market engagement in support of our delivery programme..... | 27 |
| 5.3 | How feedback from the market has directly informed our delivery strategy | 28 |
| 6. | Standardisation strategy to simplify deliverability | 40 |
| 7. | Embracing innovation to support deliverability | 41 |
| 8. | Maximising opportunities to invest ahead of AMP8 | 44 |
| 9. | Assurance and demonstration that we are ready to deliver..... | 47 |
| 9.1 | Independent assurance..... | 47 |

1. Deliverability – Capital Delivery and Supply Chain

1.1 Key messages

- **Our programme is ambitious:** We have developed comprehensive long term plans that set out how we will address the significant challenges that the water sector is currently facing. Our PR24 plan is an ambitious but necessary next step in delivering these proposals. We fully recognise that the capital programme is a step up from our current programme and that this requires new capabilities and skills that we have not tapped in to at this scale before.
- **We understand and are managing the challenge:** We have assessed and are fully cognisant of the challenges of delivering our largest ever programme. We have moved quickly to put in place a readiness programme and we are now applying these new approaches, testing them, learning from them and improving them in our AMP7 programme and under our accelerated funding streams ready for AMP8.
- **We are transforming our business:** We recognise the need to restructure our engineering, capital delivery and procurement approach and attract new skills and capabilities as well as improving our processes in order to deliver our plan. We are well underway with this and are already utilising new teams and approaches to deliver on our early start programmes and are positive about the opportunity that early funding gives to allow us to do this.
- **We are securing the required suppliers:** We have expanded our engagement approach and this has demonstrated that there is sufficient capability and capacity to support our plan. Our supply chain feedback shows that they recognise this as a huge opportunity, they feel well informed, understand the challenges and feel ready and able to deliver with us. This has allowed us to make very good progress in securing a wider range of supply chain partners than ever before.
- **Our programme is deliverable:** Although our plan is large it has been developed in a way that ensures that the pace and ambition within the plan reflects the capacity within the business and supply chain as well as the practicalities and timescales involved in transitioning to some of the new approaches that will be required.
- **We have had independent challenge to ensure we're on track:** We have utilised external expertise to support, critique and verify the details of our plan, the key assumptions supporting the plan, our delivery approach and our transformation approach. We have incorporated this feedback into our proposals and we are confident that we are ready to accelerate our delivery to meet our ambition for AMP8 and beyond.

1.2 Structure

1.2.1 This document comprises the following sections:

- **Section 2** outlines the ambitions and opportunities of our AMP8 programme.
 - It also sets out the approach we have taken to confirm that we have the capacity and capability to implement this programme and shows how we have addressed the key deliverability tests set by Ofwat.
- **Section 3** sets out how we have identified the risks and challenges that we needed to manage.
 - It also includes more detail and some case studies on some high priority areas, including alternative P removal techniques.
- **Section 4** sets out how United Utilities is transforming itself to successfully address these challenges.
 - It describes our transformation programme and highlights how we have created new directorates to focus on higher risk areas such as CSOs and Rainwater Management.

- It also sets out our resourcing and engagement strategy and shows how we are addressing our internal capacity and capability needs and utilising specialist external resources to supplement identified gaps.
- **Section 5** sets out how we have assessed the capacity of the supply chain to address the identified risks and growth areas and taken steps to secure the required resources.
 - It highlights how we have assessed local and national supply chain capacity and capabilities.
 - Shows how the extensive engagement we have undertaken has allowed us to access a broader supply chain and expand and develop our supplier relationships.
 - It also describes how feedback from the supply chain has helped to shape our future delivery and procurement model by utilising a runways approach and to take steps to manage identified risks, including targeted interventions on issues such as chemicals, river water monitors and smart meter installations.
- **Section 6** provides more detail on our standardisation programme, which is one of the key approaches we are adopting to both drive future efficiencies and support the delivery of the programme.
- **Section 7** provides more detail on our innovation approach and demonstrates why this will continue to be at the heart of our agile and evolving approach to delivering our AMP8 programme.
- **Section 8** demonstrates how we have already used our active participation in the Accelerated Infrastructure Delivery scheme and the Advanced WINEP programme, to accelerate our plan in two key areas (CSOs and rainwater management).
- **Section 9** demonstrates how we have challenged and assured the deliverability of our plan and why we are confident that we are ready and have the required capability and capacity to deliver our AMP8 programmes.

1.3 Overview

- 1.3.1 We have developed an ambitious five year plan that is designed to address the immediate challenges that the industry is facing and to make significant strides towards our longer term ambitions. In proposing this plan we recognise that it is critical for the credibility of the sector, that we are able to demonstrate that we are capable of delivering the plan and meeting our broader commitments.
- 1.3.2 Chapter 2 of our business plan sets out how we have identified the areas where we will need to make step changes in our performance and the interventions or programmes of work that will need to be implemented to allow us to meet the performance and service standards that are required.
- 1.3.3 Chapter 9 demonstrates how our robust financial structure will allow us to secure the finance required to implement these programmes, in a way that allows the programme to remain affordable.
- 1.3.4 This document focuses on the deliverability of the AMP8 capital programmes, which represents the largest five year programme we have ever proposed. This document describes how we have assessed the challenges we will face and sets out the changes we are making both internally and with our supply chain to address these challenges. It also demonstrates why we are now confident that we will be able to rise to these challenges.
- 1.3.5 We show how and why we are transforming our internal organisation and resources and optimising the way that we work with external partners in order to maximise the efficiency and effectiveness of delivery. It also demonstrates that we have already put many of these new internal structures and processes in place.
- 1.3.6 We set out how we have assessed key supply chain risks and constraints and how we have revised our delivery strategy to reflect the feedback and moved to ensure that the identified risks can be managed.

We have already secured some of the higher risk resources and components and expect that most partners will be in place by October 2024, to align with our ongoing early start activities.

- 1.3.7 We show how standardisation and innovation will be key enablers of delivery during AMP8 and beyond and provide clear case studies showing where these are already supporting delivery in AMP7 or will support delivery in the future.
- 1.3.8 We have been active participants in the Accelerated Infrastructure Delivery scheme and secured the largest programmes of work through the Advanced WINEP programme. We have used these programmes to make an early start on implementing and refining the new approaches and ramping up the internal and third party resources that will be required to deliver the AMP8 programme of work.
- 1.3.9 In conclusion we have developed a soundly based and comprehensive delivery strategy and have taken early action to start to implement and refine this strategy. We have also assessed the effectiveness of our approach by using a “3 C’s” model that is based on considering Challenge, Capability and Capacity and have shown how this addresses the key challenges that Ofwat has raised through its own deliverability assessment.

2. AMP8 ambitions and opportunities

2.1 We end AMP7 in a strong position

- 2.1.1 Our proposed £13.7 billion AMP8 plan will deliver an estimated £40 billion of value for the North West, including an environmental improvement programme, which at £5.7 billion is around seven times larger than AMP7.
- 2.1.2 United Utilities has a good track record of delivery, considerable engineering and capital delivery talent and robust financial and corporate structures. We've already exploited these strengths to ensure we are active participants in early start schemes on two key issues for future delivery – being storm overflows and rainwater management. For example through our Advanced Infrastructure Delivery programme we have been given approval to make an early start in AMP7 on one third of the CSOs we expect to address in AMP8.
- 2.1.3 We have a good track record of successfully delivering capital programmes. This includes having delivered all of our regulatory outputs on time so far in AMP7. We have also delivered large programmes of capital works in previous AMPs.

2.2 We recognise that AMP8 will bring change and opportunity

- 2.2.1 Our good position exiting AMP7 provides evidential support for our ability to deliver an ambitious plan and provides confidence that in many respects we are well placed entering into AMP8. It is right to recognise that there will, however, be challenges to delivering our plan in AMP8. These require that we give serious consideration as to how we work with partners and set ourselves up to ensure that delivery is as efficient and effective as possible.
- 2.2.2 Fundamentally, the company needs to ensure it is an attractive counterparty to a broader range of partners and suppliers than ever before. We will need to be able to attract, nurture and retain capability and talent. We will need to ensure that the mode of delivery places a greater emphasis on sustainability, working with the environment and avoiding customer disruption. We also need to underpin our approach with a commitment to the health, safety and wellbeing of our employees and the contractors and partners that work with us. All of this requires a strong focus and, in all likelihood, an agile approach to managing ongoing and emerging risks.
- 2.2.3 We should also reflect, however, that with challenges come opportunities. Our approach to AMP8 delivery offers opportunities in the following areas.
- **Delivering value tailored to local priorities** – Our plan has been developed to deliver tailored outcomes to local areas. Our 'Five Counties' approach is already delivering more through enhanced stakeholder relationships (for example with customers, planning authorities and other utility companies), better information sharing and improved and prioritised decision making. This accelerates successful delivery of our environmental goals as well as service improvements that matter for customers and communities. Our plan will also contribute to creating and supporting over 30,000 jobs through a combination of direct employment and through our supply chain.
 - **A broad, more diverse supply chain** – The size of the programme provides opportunities – and in some cases a necessity – to develop a broader and more diverse supply chain. We've been able to share a longer-term outlook on our investment approach and have engaged our supply chain to join and help us in this transition. Our assessment shows that this new and more diverse supply chain will have the capability and the capacity to deliver our plan in collaboration with us and that they are engaged and excited by the opportunity.
 - **A new way of working** – We have recognised the need to transform our business ready to take on the challenges of AMP8 and beyond. Our Transformation Plan is wide-reaching and sees the creation of new teams dedicated to key growth areas of our programme and a new state of the art PMO

function to lead delivery of our largest ever plan. We have also created a new delivery model which opens up opportunities for partners we've not worked with before. We are well underway in securing this larger and more diverse supply chain.

- **An attractive place to work focused on new skills and nurturing new talent** – We know successful delivery requires an increase in the numbers and types of resources both within and outside of our company. We have a strong and supportive culture at United Utilities, high levels of workforce engagement and a track record of developing and nurturing new talent. Our resourcing strategy is strong and we are on track to securing the key partners we need to support and supplement our in-house expertise. Additionally, we are leading on projects that are helping us to identify and access skills and knowledge from further afield, using techniques and approaches not traditionally adopted within the water industry.
- **A springboard for digital transformation and innovation** – From artificial intelligence to construction robotics our United Utilities and partner teams have ensured we are at the cutting edge of new ways of working that enable deliverability of our plan. Digital transformation and innovation are key focus areas for AMP8 and beyond.

2.3 From long term planning to meeting the deliverability challenge

- 2.3.1 We recognise that all stakeholders believe that the industry must deliver even more for customers and the environment in future. We have described ambitious long term outcomes and aims in our Long Term Delivery Strategy, supported by key regulatory submissions such as our Water Industry National Environment Programme (WINEP), Water Resource Management Plan and Drainage and Wastewater Management plan. These plans meet the government's key targets, our known statutory obligations and customers' priorities for the water industry and the environment. However, as the AMP8 WINEP was being prepared, our long term delivery strategy (LTDS) was being created and as we stepped into designing our Storm Overflows Discharge Reduction Plan we recognised that there would be a significant increase in the capital works for the coming AMP period.
- 2.3.2 Recognising this we have reviewed the way in which works are procured, contracted and delivered and have embedded or are making the changes necessary to succeed in AMP8. This includes transforming the approach to engineering and capital delivery, further nurturing innovation and a place based planning approach in each of the five counties we serve.
- 2.3.3 The successes we have seen so far in implementing our transformation programmes have allowed us to propose ambitious and stretching targets for the AMP8 period. These mean that we can move forward with confidence and make significant steps towards delivering longer term targets such as those in our LTDS.
- 2.3.4 Our open innovation model is stimulating innovation activity across the company and encouraging new ideas to be developed, tested and adopted with appropriate knowledge sharing across the sector. We are building strong partnerships with matched or leveraged funding opportunities.
- 2.3.5 We have adopted place-based planning across each of our five geographical regions. This is called our "five counties" approach and takes account of the specific operational challenges and environmental drivers in each area.
- 2.3.6 All this planning, preparation and insight into potential innovations helps us to identify what we plan to deliver, where and when. However, delivering the plan on the ground means bringing it to life and making our proposals a reality. This document sets out our structured approach to ensuring that we can deliver on our plan's promise, taking into account our existing and future required internal capability and that of supply chain partners as they deliver programmes, projects and crucial goods and services.

2.4 The 3Cs approach: Challenge, Capability and Capacity

- 2.4.1 We have taken a measured and objective approach to assessing the deliverability of our plan utilising our “3 Cs” approach.
- **Challenge:** As part of the “Challenge” process we ask ourselves what challenges exist that might create risks to successful delivery. We need to understand how our plan might be impacted by external forces and whether we are set up for success. We do this through both internally generated assessments of our strengths and capabilities - including where things have gone wrong - and also by using external experts to challenge our assumptions and bring external knowledge and expertise to help us build a robust delivery plan. These challenges help us address issues we need to confront – including those of capability and capacity.
 - **Capability:** Having capability means ensuring that our organisation is match fit to deliver our ambition and that we have a supply chain and partners that will support and assist us in successful execution of our AMP8 plans to time, cost and quality.
 - **Capacity:** Having capacity means ensuring that there are sufficient and skilled resources available, both in United Utilities and through the supply chain, to not only successfully deliver the programme, but to do so in a way that maximises the opportunities the plan has to offer.
- 2.4.2 Our analysis under the 3Cs often reveals interlinking problems and/or solutions. For example, investing in upskilling and finding new talent will not only improve organisational capacity, but it will also deliver enhanced capability. Likewise, working with the supply chain identifies to them and to us potential challenges to capability that we can work together to resolve.
- 2.4.3 This document contains many examples of where we have acted to identify and resolve issues through Challenge, address Capability or improve Capacity. Some of these are shown in Table 1 below:

Table 1: Actions in response to challenge, capability and capacity

| Challenge | Capability | Capacity |
|---|---|---|
| Commissioned WINEP independent scrutiny and optimisation panel | Created new directorates with specific focus on new, growth areas such as CSOs and rainwater management | Undertook heatmap analysis to identify internal and external (supply chain) constraints |
| Secured support from leading organisations including Arup, Mace and Alvarez and Marsal to support our readiness programme | Recruited new design, delivery and commercial expertise with a robust ongoing resourcing plan | Created the right conditions for in-depth and detailed engagement with the supply chain |
| Considered the deliverability of our plan opposite the key tests outlined by Ofwat | Created new PMO capability focussed on programme optimisation and risk management | Engaged extensively across the supply chain to design a new delivery model that is fit for purpose for AMP8 |
| Undertook work with Deloitte to obtain an assurance review on our approach | Driving a localised, 5-counties approach to designing and executing the plan | Took active steps to mitigate supply chain risks for critical goods |
| | Using early start and advanced investment opportunities increases skills and capability ahead of time | Early commencement of AMP8 schemes in AMP7 helps increase remaining AMP8 capacity |

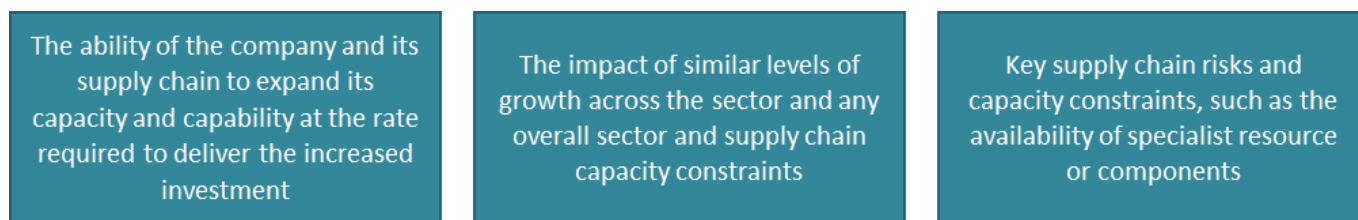
- 2.4.4 We will continue to be vigilant regarding new and emerging risks and will look to regularly review and refresh our approach to managing deliverability risk across the remainder of AMP7 and AMP8.

2.5 Key deliverability tests

- 2.5.1 As part of its PR24 final methodology, Ofwat set out its expectations on Board assurance over deliverability, requiring that Boards have challenged plans and satisfied themselves that “PR24 plans

and the expenditure proposals within them are deliverable and that the company has put in place measures to ensure that they can be delivered. This includes setting out the steps the Board has taken to satisfy itself that supply chain risk is manageable and delivery plans account for" the following three areas (shown in Figure 1):

Figure 1: High Level Deliverability Tests



2.5.2 We have therefore ensured that whilst assessing our plan against the 3 C’s approach, United Utilities has also fully explored and held itself to account opposite the key Ofwat tests on our capital delivery programme.

2.5.3 Figure 2 below summarises how some of the actions we have taken address the high level deliverability tests set by Ofwat and identifies where in this document further information on each point can be located.

Figure 2: Examples of how we have met key Ofwat Deliverability Tests

| | | | | | |
|--|--|---|--|--|--|
| <p>1. The ability of the company and its supply chain to expand its capacity and capability at the rate required to deliver the increased investment.</p> | <p>Implemented an organisational wide revised operating mode supported by ARUP 4.1.3</p> | <p>Investing in our people and skills to retain and attract the skills we need 4.4.3</p> | <p>Adopted a 5 Counties place based planning approach 4.6.1</p> | <p>Commenced procurement to appoint the right supply chain partners 5.3.3</p> | <p>Shared a long term view of investment to encourage growth across the sector 5.3.22</p> |
| <p>2. The impact of similar levels of growth across the sector and any overall sector and supply chain capacity constraints</p> | <p>Appointed an Independent Scrutiny Panel 3.2.1</p> | <p>Advanced WINEP and focus on Partnership Working 4.6.6</p> | <p>Two Prior Information Notices (PIN) issued to the market. Nine supplier engagement events and 50 workshops 5.2.2 - 5.2.4</p> | <p>Designed a fit for purpose delivery model to maximise market capacity and skills 5.3.16</p> | <p>Assessed the market to confirm capacity across the sector 5.3.32</p> |
| <p>3. Key supply chain risks and capacity constraints, such as the availability of specialist resource or components</p> | <p>Procurement underway for supply & design partners and specialist skills such as nature based solutions and smart metering 4.5.7</p> | <p>Extensive supply frameworks in place for critical equipment, materials and kit allows us to lock-in pricing and secure supply 5.3.37</p> | <p>Aggressively pursuing product and solution standardisation to allow a “design once, deploy multiple times” approach 6.1.1</p> | | <p>Leveraging innovation and seeking new ideas that can be sourced, tested and adopted 7.1.1</p> |

2.5.4 The remainder of this document shows how we have utilised the lenses provided by the 3Cs to consider our approach to the challenges and risks of the plan and build confidence that we are capable of delivering this ambitious programme.

3. Identifying the challenges of our AMP8 programme

3.1 The context of our work in AMP8

- 3.1.1 United Utilities plays a vital role in making the North West stronger, greener and healthier. Our AMP8 plan is the largest plan we have proposed and have to prepare to deliver. We do not underestimate the scale of this task and recognise that it is important that we secure all the potential benefits that the programme can deliver for the people, communities and environment of the North West.
- 3.1.2 We are looking forward to supporting economic growth across the region. As we expand to meet the challenges of AMP8 we will work alongside our supply chain to encourage and discover new ways of conducting our business that support our customers and communities. The work proposed within our business plan will attract additional resources and opportunities for people across the region, helping communities to thrive.
- 3.1.3 We also recognise that as well as successful delivery of the programme, we need to ensure that the process of delivery is not disruptive to customers and businesses. During AMP7 our infrastructure delivery in Cumbria (Thirlmere Aqueduct and Williamsgate WTW) and Cheshire (Vyrnwy Aqueduct) and the associated community engagement ensured an efficient delivery that limited the impact on customers and served to increase business activity within the local area. We now have the opportunity to take the experiences and learning from these projects and apply them across our region in AMP8 to maximise the benefits for everyone we engage with.
- 3.1.4 Over previous AMP periods we have shown our ability to successfully scale up to meet the challenges of large programmes which have helped us to become a positive element within the day to day lives of our customers. For AMP8 we have started with the same customer focused outcome in mind, however, this time we have the opportunity to go further at a faster pace. There is ambition across the organisation to deliver our programme at the right time, at efficient cost and to high quality. We have sought external scrutiny and advice to help make this a reality.

3.2 Independent challenge of our WINEP build

- 3.2.1 In May 2022 we commissioned Arup to lead an independent scrutiny and challenge process on the development of our WINEP submission. This is an ongoing process which is helping to inform United Utilities about whether the scope - as driven by WINEP guidance - and costs of the plan are appropriate and whether the programme has been appropriately optimised. In addition to Arup the reviewing panel is made up of the following five individuals:
- Trevor Bishop (Chair), Water Resources Director of Environment Agency
 - Alistair Chisholm, Director of Policy at CIWEM
 - Bernice Law, Chair of Your Voice Customer Challenge Group
 - Ryan Harris, Partner and Senior Commercial Director at Arcadis
 - Simon Wright, Qualified civil engineer, and previous CEO at Crossrail
- 3.2.2 To date Arup and the panel have engaged in two periods of review of the United Utilities submission. We expect the challenge from the panel to be renewed and refreshed over time to ensure that we are actively challenging ourselves to optimise our approach.
- 3.2.3 The impact of the early challenge to our programme build has been significant. Arup reported to the Independent Panel in December 2022 that:

“United Utilities had positively responded to the challenge and scrutiny applied to it from Arup and panel members with a very significant amount of work undertaken since their first review”.

3.2.4 Arup specifically noted:

“a strong push across the leadership and operational teams on trying to ensure that the programme achieves a balance of solutions across traditional engineered approaches and alternative solutions where these are feasible and appropriate”.

3.2.5 The panel also reviewed our approach to allocation of risk to a programme of this size. It broadly endorsed the logic of the approach but raised concerns that across a broad programme the level of risk allowance, whilst within acceptable levels, was at the lower end of the range they would expect. We expect the understanding and assessment of risk for a programme of this size will continue to evolve as certainty on requirements and solutions matures.

3.2.6 The executive and Board have found this independent challenge particularly helpful and intend to continue this approach as we work to overcome deliverability challenges whilst maximising the benefits we can deliver during AMP8.

3.3 Identifying and mitigating key programme risks

3.3.1 In developing our AMP8 investment plan we have undertaken a detailed review of our capital delivery programme together with a review of both the operational and customer demands of AMP8 and beyond. Part of the review exercise has been the undertaking of an impact assessment of factors which pose a challenge and potential risk for our business and our supply chain in delivering the AMP8 investment programme.

3.3.2 Following our review we have identified the following key challenges to delivery:

United Utilities resource capacity and capability

3.3.3 It is clear an investment plan increase of this scale requires significant resource to ensure projects progress from inception to delivery in the most efficient way, particularly in terms of engineering design and programme management. In undertaking the impact assessment at such an early stage United Utilities now has a clear understanding of resource requirements which means that we are well advanced in the recruitment processes required to ensure we have both the capacity and capability to deliver.

3.3.4 Opportunities to increase resource capacity for delivery are being identified through our innovation projects, including those that arise from Ofwat’s own innovation competition. Changemaker3D and Manchester Metropolitan University are partners to UUW on the Water Industry Printfrastructure (WIP) project (see Deliverability Case Study 1 below.) The 3D printing approach is principally aimed at mitigating production volume risk. However, our partners also have growth strategies specifically designed around training and developing individuals in the use of new printing technologies within the communities where they will be used. Changemaker3D, who United Utilities started working with as an outcome of our Innovation Lab have helped us to incorporate their social value approach into further innovation schemes in preparation for AMP8 and our resource demand. Information about our innovation strategy is available in supplementary document *UUW49 – Innovation framework and strategy*.

Deliverability Case Study 1: Innovating in construction and maintenance efficiency to support deliverability of our programme – our Ofwat Innovation Competition Project, Water Industry Printfrastructure

Background

To achieve the increasing demand for construction resources across the water industry we need to discover, understand and apply new ways of working. Over the past few years United Utilities have been leading the water industry in understanding how best to use 3D printing. This approach to construction, whether it be concrete printing of new assets or polymers printing of replacement mechanical and electrical parts, has the potential to completely change the way we

Figure 3: Our planned 3D printing hub

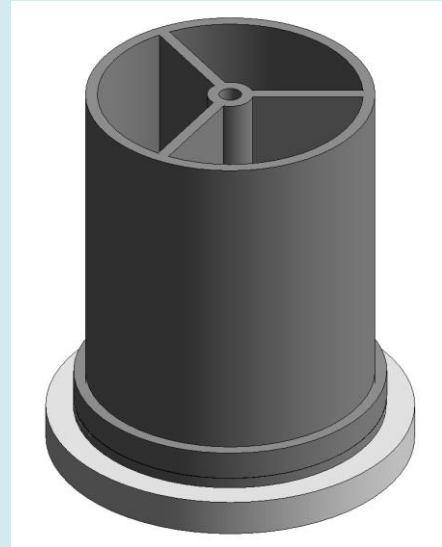


think about our business as usual delivery of solutions. By applying printing within our programmes we can reduce health and safety risks, improve compliance with regulatory standards, reduce construction times and improve on operational resilience.

What we have done

Our Innovation Lab funded the 3D printing of the first water retaining structure at our Weaverham WwTW in 2022 (Figure 4 and Figure 5). Alongside ChangeMaker3D, our SME supplier for this first step, we were able to show how the successful adoption of this technology could improve deliverability of construction programmes. Following on from this initial study we applied to the Ofwat Water Breakthrough Challenge 3 Catalyst Stream for £1.7 million of funding for both concrete and polymer 3D printing. Our Water Industry Printfrastructure (WIP) project, currently being delivered and including partners from the water industry and academia, plans to operationalise 3D printing by bringing the technology to the forefront of our business activities (Figure 3). By studying the requirements of projects within our AMP8 early start programme we have been able to identify assets where concrete and polymer 3D printing can be of benefit. This includes uses within our CSO (water quality monitoring stations) and Rainwater Management programmes.

Figure 4: Digital Design of our Chamber



Supporting AMP8 Deliverability

This is a great example of our company fostering SME's with great ideas to move into the water industry and support with our AMP8 challenges (and beyond). As the lead organisation of the project United Utilities are supporting the wider water industry to move forward with alternative ways of working as a means of addressing resource challenges. Our 3D printing technologies (concrete and polymer printing) draw on skills not traditionally used within the water maintenance and construction industries. This will broaden our resource base and mitigate the risk of resource availability such as construction materials and knowledge. Our project also incorporates a focus on social value. United Utilities and partners are seeking opportunities to support individuals from less advantaged communities to train and become experts in 3D printing and plan to link this up with Fab Lab. This will reduce pressure on traditional construction resources increasing deliverability across the water industry in AMP8

Figure 5: A delighted ChangeMaker3D team following their first asset print



Supply chain capacity and capability

- 3.3.5 We recognise that we cannot deliver a plan of this size alone and that, more than ever, we will need the assistance and support of our supply chain partners to ensure we deliver on all fronts. We have identified those areas where we most need assistance and have already engaged with our supply chain. This has been done via PIN notices, at commercial led market engagement events and at one-to-ones giving us the opportunity to share our vision and 25 year long term plan and to understand the capacity of the supply chain, and their ambitions to be part of this exciting time for our business.
- 3.3.6 We started engagement activities in May 2022, having organised nine supplier events and 50 one to one workshops. This included understanding market capacity and constraints, how we mitigate risks and how we can support suppliers with their growth strategies in the North-West. We have also discussed how our global delivery focus can access supply chain resources across different time zones, providing a 24-hour design development and specification cycle, utilising our design standardisation model. More information on this is provided in Section 5 of this document.

- 3.3.7 We have also commenced the process to appoint two Strategic Solution Identification Partners (SSIP). These partners will help us achieve our AMP8 commitments by challenging alignment to customer requirements and directing projects through the most flexible and efficient route to delivery. Again, we provide more information on this in Section 5.
- 3.3.8 Given the increased demand for labour, equipment, and materials we believe this early engagement has helped us get one step ahead in a time of competing demands from other large-scale construction programmes and allow the supply chain to invest in their own local North-West based delivery infrastructure. Following the delays on other significant construction projects, e.g. HS2, SMART Motorways and Trans Pennine Rail, we see our AMP8 programme as a significant opportunity to provide the supply chain with alternative opportunities and generate further employment.

Efficiency of solution and intervention design

- 3.3.9 The volume of production and investment in AMP8 presents challenges to capability and capacity. To deliver this we see a significant opportunity to make solution designs more standardised and replicable. In turn this will help accelerate projects to the construction phase in a more efficient manner and assist the supply chain in becoming more efficient and cost effective. More information on this approach is provided in Section 6 of this document.

Equipment/materials availability

- 3.3.10 We have identified key pinch points of availability for equipment and materials. We have already engaged with suppliers of some materials - such as chemicals - in conjunction with some of the other water companies. This has provided early visibility of increased demand in AMP8 and has allowed suppliers to start investment in new production lines to ensure the demand can be satisfied for United Utilities and neighbouring water companies. In relation to smart meters we have already started a tender process to widen the supply base and give us better security of supply with a number of suppliers mitigating the risk of a single source supplier. United Utilities already has agreements in place for general construction materials. However, recognising the increase in volume into AMP8 we are reviewing these and also those of our supply chain.
- 3.3.11 Our AMP8 programme will also draw upon new resources and materials to help reduce the pressure on standard approaches and solutions. An example of this is one of the innovation projects we are undertaking as part of the Ofwat innovation programme, Alt-P, (See Deliverability Case Study 2). As part of this project we have identified a range of new approaches for phosphorus removal at rural wastewater treatment works including the use of natural coagulants. We are already in discussions with suppliers to understand how they will be able to expand their North-West based supply network and production activities to satisfy United Utilities' demand. These discussions also include how such suppliers will enhance broader social and economic value by supporting local communities with employment opportunities and training.

Deliverability Case Study 2: Broadening the toolbox for Phosphorus Removal – Our Ofwat Innovation Competition Project, “Alt-P”

Background

The UK water industry has become dependent upon the supply of chemicals for phosphorus removal from wastewater. We are leading a project to overcome the following issues relating to our current business as usual solution, metal based coagulant dosing.

- **Industry demand** – At United Utilities we had c.900 phosphorus removal schemes during AMP7 the majority of which are being solved through the addition of metal based coagulants.
- **Carbon impact** – Carbon emissions from chemical dosing for phosphorus removal significantly increase once AMP7 solutions

Figure 6: Our alternative P removal test bed at Woolton WwTW



are implemented. This is set to increase by the same magnitude if chemical dosing is the only option available for our industry's AMP8 phosphorus removal schemes.

- **Impacts on customers** – Chemical dosing at rural works impacts local communities through additional large vehicles requiring access to sites down narrow country lanes. This causes pollution from the vehicles and congestion. This is increased through the requirement for chemicals to only be stored at site for 2 weeks before requiring a delivery and that chemical addition increases sludge removal from wastewater which also requires transporting off site.
- **Chemical Supply** – Operational resilience is also impacted if we continue with the current method of phosphorus removal. There may not be enough metal based coagulant available to address demand. Water companies therefore risk compliance failures if they are unable to arrange chemical deliveries as none is available. There is also an issue relating to chemical quality. We are finding that we need to dose more chemical to achieve the required outcome. This increases the number of deliveries required at site, impacting on our customers

What we have done

Our Alternative Approaches to Phosphorus Removal (or Alt-P) innovation project, led by United Utilities, has brought together eight partner organisations to develop alternative phosphorus removal technologies not previously used within wastewater treatment (Figure 7). This toolkit of available techniques, shared across the water industry, will help us all move away from metal based coagulants and address the issues listed above.

As part of this programme we are evaluating the technologies to understand the operation and maintenance requirements so that water companies can make informed decisions regarding which is most suitable for their specific site location and deliver best value to customers:

- Electrocoagulation provides the direct application of coagulant, via electrically pulsed plates, into the water column. This allows for a more efficient reaction and removes the need for chemical deliveries at rural sites
- Natural coagulants are plant based liquids dosed into wastewater to aid solids removal and in some cases soluble phosphorus removal has been observed.
- Reactive media have been used in the water industry before, however, water companies do not have a common approach to specifying and testing leading to each supplier having to carry out evaluation work with each company. Our approach allows for organisations to collaborate in finding out what different reactive media are capable of and therefore provides a more efficient means of testing and approving.

The unique quality of the Alt-P project is the side-by-side testing of treatment systems from different project partners. This collaboration brings together ideas and ways of working from across the supply chain.

Supporting AMP8 Deliverability

The new approaches will allow us to spread our requirements across a more broadly based supply chain, improving delivery times and resource availability, along with reducing our demand on a supply chain pinch point, chemicals. In some cases our project is introducing new organisations to the water industry and therefore increasing the available resources for delivery. The technologies are also modular in design which helps to reduce delivery times, installation times and ultimately allows for flexibility of resources across the AMP8 programme.

- 3.3.12 In addition to the above challenges and opportunities we have identified two key growth areas where there is a particular requirement for additional expertise to deliver our AMP8 programme.

Figure 7: Organisations brought together in Alt-P



CSO programme

- 3.3.13 We have a significantly higher proportion of combined sewers than any other region. Over 54% of our sewers combine foul and surface water compared to an average of 33% across the industry. This is one of the drivers of United Utilities having 25% more sewer overflows than the industry average. AMP8 provides a major opportunity to reduce the use of CSOs and improve water quality within our rivers. This has started in AMP7 during which we are investing £230m to improve 184km of river from 29 CSOs. This has enabled us to bring together a CSO specific team within United Utilities which can hit the ground running to meet the demands of the 435 CSOs within our AMP8 programme of which 154 have already been started. Our accelerated programme means we can grow our knowledge and experience of location specific requirements enabling us to provide the most appropriate solution for each issue and limit impacts on customers. Our early start on the programme not only means that we are accelerating delivery timelines; it also means we are acquiring, developing and harnessing relevant skills and experience ahead of commencement of AMP8.

Rainwater Management Programme

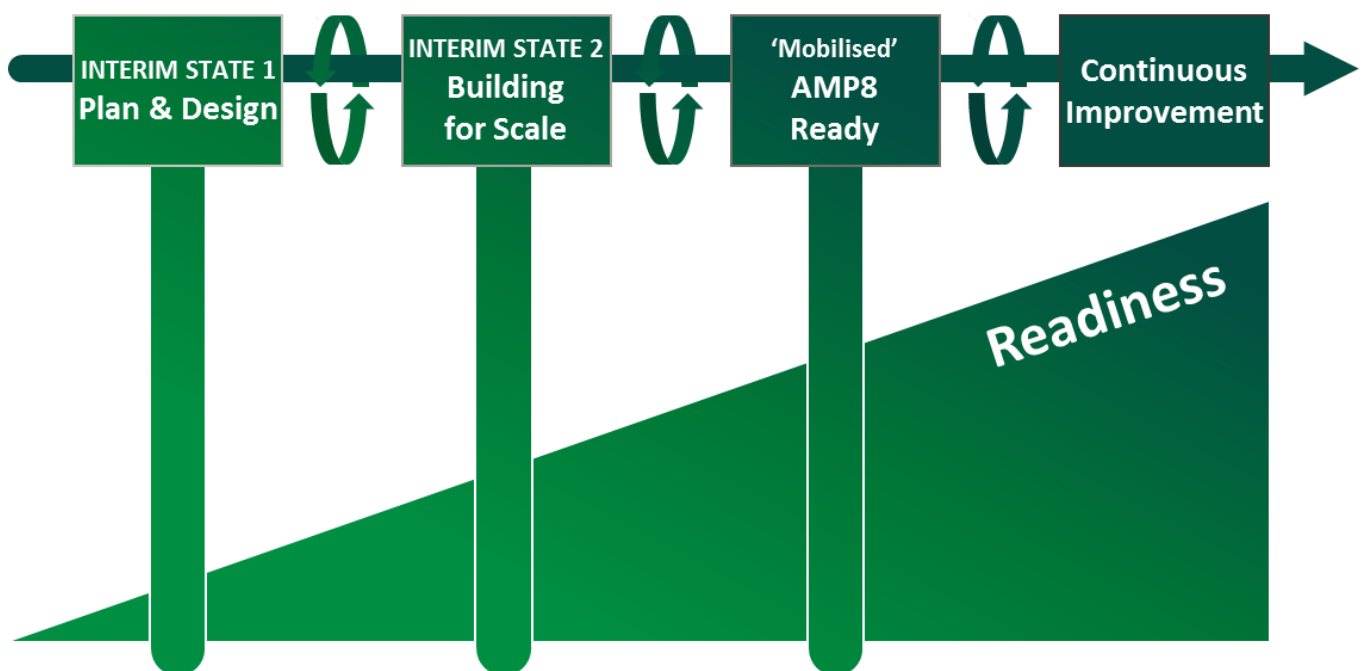
- 3.3.14 Rainfall in the North West is considerably higher than in many other regions but run off rates can be significantly localised. The technical challenges presented by the range and the increasing frequency of high volume rainfall events has led to the requirement for specific rainwater management programmes in specific locations. This area of technical expertise has led us to both engage different resources within our supply chain and identify how we can repurpose existing internal knowledge and experience to this key challenge. We are gaining good experience of how we can actively involve customers and other partners in managing rainwater and we see the partnership delivery model as essential to future success. These partnerships are intrinsic to our AMP8 Advanced WINEP programme which we aim to be a source of new, innovative approaches to dealing with the challenges of rainwater management for many years to come.

4. United Utilities and its partners in AMP8

4.1 United Utilities' transformation programme for AMP8

- 4.1.1 Our AMP8 Transformation is already underway and commenced early in 2023. We appointed Arup, with its global experience supporting organisations with large capital programmes, as our Transformation Programme partners to enable us to develop a best-in-class approach to delivering our plan.
- 4.1.2 Arup's study assessed our revised delivery model and procurement approach. It also identified workstreams such as organisational structure, people, culture and governance of the mobilisation plan as critically important given the scale of change needed to set the organisation up for success in AMP8 and to transition effectively from AMP7. These workstreams will allow us to understand the skills, capabilities and culture needed in AMP8, and to develop specific strategies to respond to its challenges. The steps to readiness, as reflected in the Arup report, are provided in Figure 8 below.

Figure 8: Our Transformation Journey Stages



- 4.1.3 As an outcome of this review we have created a new target operating model with delivery team structures aligned with the five counties approach and the revised procurement delivery model. This means that we are equipped to deliver the AMP8 projects as they are launched, with our early start projects allowing us to test and embed this model before April 2025. This is a great benefit of participating in the Accelerated Infrastructure Delivery Project as it provides the opportunity to test, learn and improve quickly before the AMP formally starts
- 4.1.4 We have established a Transformation Directorate, a team of specialists focused on how we move from our AMP7 programme to the delivery of our larger AMP8 plan. The team includes representatives focussed on data, information, processes and systems to ensure we embed a truly organisation wide approach. It is also supported by our innovation team, ensuring that we take a structured approach to looking at how we can do things differently across all of our business areas. Transformation will be embedded in stages and will take a series of steps over the next 18 months resulting in United Utilities being at the required capacity for the AMP8 programme before the start of 2025.
- 4.1.5 Our transformation team is working alongside our programme specific teams to learn quickly from accelerated and early AMP8 projects and adapt as more challenges become clear. We will require an agile and adaptive approach to succeed and have built this into our transformation plan through transparency and progress updates across our organisation. By communicating widely and listening to

feedback we will understand quickly where any new risks are materialising and improvements can be made.

- 4.1.6 Communications with teams across United Utilities are essential to delivering the required transformation and ensuring they understand the changes to their roles ahead of AMP8. Maintaining engagement is achieved through a range of approaches, from “All Hands” briefings to communicate broad progress and common challenges, to smaller group discussions so that colleagues can engage with specific questions and also open up discussion on elements of our plan.
- 4.1.7 We have always believed that having open discussions with our internal teams, understanding individuals concerns and helping each other to overcome issues makes us stronger as an organisation. In the context of the transformation for AMP8, however, it is also an important part of securing staff retention and maintaining high levels of engagement during a period of significant change. We are also finding that our early start on AMP8 programmes through the Green Recovery and Accelerated Infrastructure Delivery projects have provided early opportunities for existing staff to take on additional responsibility and grow alongside the organisation. Nurturing colleague development is an important element of ensuring we are match fit to deliver our AMP8 plan.

4.2 A new Programme Management Office

- 4.2.1 Given the size and scale of the programme we have also reviewed the needs of our Programme Management Office (PMO) to support the AMP8 programme, utilising Mace as a strategic partner to bring a view on cross industry best practice. We have now initiated a change programme covering the following key areas:
- **People** - assessing and delivering key resource and capability requirements;
 - **Organisation** - ensuring appropriate and pragmatic programme governance;
 - **Process** : delivering consistent, lean processes to deliver predictable outcomes;
 - **Information** - reliable and accurate data, enabling consistent reporting; and,
 - **Technology** - ensuring that data is managed efficiently, automated where possible, to avoid duplication of data handling and reporting
- 4.2.2 Our PMO will provide:
- Enhanced capability to support the AMP8 programme;
 - The ability to optimise the delivery programme around delivery capacity, resource capacity, outage planning, avoiding customer disruption;
 - Accessible project performance and progress information to support project managers and stakeholders; and,
 - Proactive and forward-looking programme information to support risk identification and mitigation, governance and decision-making.
- 4.2.3 The AMP8 programme provides an exciting opportunity to explore the benefits that can be realised through utilisation of AI and automation across the delivery lifecycle. We are working with our supply chain to explore these, including:
- Interrogating project programmes to predict performance and identify potential delivery constraints;
 - Streamlining contract formulation;
 - Reducing quantity surveyor workload allowing a focus on higher value activities; and,
 - Automating low-value procurement activity

4.3 Robust resourcing and engagement strategy

- 4.3.1 We recognise that we are a significant employer in the region, with a far reaching economic impact not only with respect to direct employment but also significant regional, and UK supply chains. In AMP7 we currently support employment for over 30,000 FTEs and this will grow in AMP8 as a result of our larger investment programme. Our assessment has shown that attracting and retaining skilled resources is a critical enabler to AMP8 delivery.
- 4.3.2 Our colleagues are at the heart of our current and future success, and we are committed to providing a safe and great place to work. Colleague engagement has been strong this year, and we have achieved an engagement score of 82%. This is higher than both UK Norm and Utilities Norm benchmarks.
- 4.3.3 Informed by the Arup review we recognise the need to transform our business and our resource models across all functions including Capital Delivery, Operations, Asset Management and Transformation.
- 4.3.4 The capital works delivery for United Utilities sits within our existing Commercial, Engineering and Capital Delivery function, which currently has 436 internal staff to manage the current £3.9 billion capital programme. Within this directorate, there is an internal engineering function comprising 224 internal staff. This is supplemented with an Engineering Service Design partner that provides approximately 120 design resources. Additionally, the Directorate currently has 62 resources in the Commercial team and 140 in Capital Delivery.
- 4.3.5 We believe we have one of the largest and well-trusted engineering functions of the water industry, with sector recognised experts. We already have a large in-house modelling team (37 specialist network modellers) who are instrumental in developing the models that have been used to identify our system needs and to feed into our business plan requirements. We already have an industry expert leading our network delivery team, who is Committee Member for the CIWEM Urban Drainage Group and advises the industry via Task and Finish Groups and other technical steering groups with the Environment Agency on Urban Pollution Management. Taken together, this means we have been well placed to respond to the growing requirements of the CSO programme.
- 4.3.6 However our assessment shows that due to the scale of the AMP8 programme we are going to need to achieve more and grow further expertise. We have developed a Resource Management Strategy where we have completed an assessment exercise of the numbers and timing of growth of resources across the AMP. We have broken this down into internal resources and consultancy resources with a particular focus on resources required for the detailed design activity supporting the “Build Only” runway of our new delivery model.
- 4.3.7 We have also created a capability sourcing plan with specialist support from Arup. We have assessed over 250 capabilities against the requirements for AMP8. Based on this we have created a plan based on our knowledge of the critical needs and gaps. Mobilisation was identified as an area of concern. Taking this on board, we have already started acquiring the knowledge and experience for our early start programmes through direct recruitment and supplier assessments.

4.4 United Utilities' internal capacity and capability needs for AMP8

- 4.4.1 In response to the anticipated resource challenges and as part of the wider AMP8 transformation, we have carried out significant work developing an efficient target operating model for AMP8. This has been designed with the support of the external consultancy Alvarez & Marsal, specialists in efficiency and value creation programmes. As part of this work, we have rigorously reviewed existing ways of working and made significant efficiencies across the entire organisation (from capital delivery to corporate functions and operations) to drive out waste and create capacity for the existing resources, allowing United Utilities to deploy existing resource and capacity onto the accelerated AMP8 programmes, rather than recruiting new hires.

- 4.4.2 As part of this work and applying the target operating model to the AMP8 programme of work, we derived the cost to serve models allowing an estimate of the resources needed for AMP8 to be produced. We now understand our peak workload demand based on our new delivery model.
- 4.4.3 The increase in people resources needed to deliver the programme will be sourced through a mix of internal staff (direct recruitment of new employees, internal recruitment and up-skilling, trainee development) and consultants through our supply chain. Resource requirements have been identified as a critical pinch point in AMP8, and United Utilities will be broadening its supplier base for resource provision to ensure that as demand for enabling resource grows, we have access to a wider range of resource providers to supplement the internal employee pool.
- 4.4.4 Regarding internal staff, we believe our Construction Supervision and Engineering staff will remain relatively stable and Programme Management will need to increase by circa 30%. Construction related commercial resourcing has the highest growth requirement, with our assessment showing a potential need for a 250% increase in resource.
- 4.4.5 We have determined the total of external consultant resource required, predominantly in Engineering and Design support but also programme management and construction supervision. However, we are currently working on opportunities through innovation in AI, machine learning and design automation to reduce additional resource requirements and become more self-sufficient and resilient.

Enhancing our internal capability attracting new talent

- 4.4.6 In order to recruit internal staff resources, we are already planning for the future to develop our internal capability and capacity. We have a strong business ethic to grow and develop talent within the company. We are continuing to develop our internal capability and capacity across Engineering, Programme Management, Capital Delivery and Commercial, both now and for the future. We have several initiatives already in flight.

Attracting talent to the water industry and our early careers support

- 4.4.7 We have recruited record levels of apprentices onto our award winning and Ofsted rated programmes this year and are proud that one of our own colleagues has been awarded the UK's apprentice of the year at the National Apprenticeship Awards. We have also launched our new green apprenticeship scheme to recruit 100 apprentices by 2025, who will actively contribute to our environmental delivery.
- 4.4.8 We have a well-established graduate programme and continue to recruit increasing numbers of talented graduates across the organisation, including Future Operations Leaders, Finance, Scientific, Project and Programme Management and Engineering.
- 4.4.9 Our Project Management and Engineering programmes are accredited with relevant professional bodies, such as Institution of Civil Engineers (ICE), Association for Project Management (APM) and Chartered Institute of Water and Environmental Management (CIWEM), amongst others. The programmes are subject to regular re-accreditation and have received highly commended praise on all our recent reviews. Our aim is to fast track our graduates to becoming chartered by providing them with relevant work based experience with appropriate responsibility from the start. The AMP8 programme will enable us to increase our home-grown talent and provide the Project Managers and Engineers of the future with fantastic career opportunities into AMP8 and beyond.

Figure 9: Sam Johnson, Apprentice Credit Controller and UK Apprentice of the Year



Further Talent Development

- 4.4.10 Where we have apprentices who demonstrate the drive and desire to continue education to degree and masters levels we have supported their talent and ambition by sponsoring them to complete their degrees and then moving them onto our graduate programme.
- 4.4.11 Ben Read joined United Utilities in 2014 as an apprentice Field Service Engineer. Having completed his advanced level apprenticeship in Engineering he completed his degree in Industrial Engineering, and has finished our Mechanical Engineering Graduate Programme. Ben is currently studying a Masters degree in Reliability Engineering and Asset Management, and intends to apply for his chartership in the near future. Earlier this year Ben was announced as the National Professional Young Engineer of the Year by the Pump Centre¹.
- 4.4.12 Our AMP8 programme will support our continued recruitment and the opportunity to attract and develop young talent and people in early careers to ensure the pipeline of project managers and engineers for future programmes.
- 4.4.13 This is against the background of an already strong track record. We are ranked in the top 100 companies in the Financial Times Inclusive Leaders Index 2023, having improved on our position from last year, and are the only UK utility company in the top 100. We are recognised as one of the top 15 FTSE companies when it comes to women in leadership, having exceeded the 40 per cent target for Women on Board and Women Leaders set by the FTSE 100 Women Leaders Review.
- 4.4.14 In order to encourage school children to join our industry, United Utilities has formed an award winning partnership with TCAT (The Challenge Academy Trust), creating a first-of-its-kind project that aims to develop industry led, education inspired project learning from across STEM (science, technology, engineering and maths) disciplines. We work with TCAT to provide opportunities for students from local areas of deprivation to work with United Utilities' engineers at a specially developed STEM technology centre to get a taste of engineering for their future studies and careers.
- 4.4.15 As part of TCAT we sponsored the creation of a "FabLab" at Beamont Collegiate Academy in Warrington. The FabLab is a CataPULT type facility for school children and will be home to a range of industry leading equipment, including large 3D printers, laser cutters, robotics, drone technology and virtual reality tech, as well as traditional craft tools. The facility is available for use by other schools across the region.
- 4.4.16 We are active participants in the national career development programme to boost diversity called "10,000 Black Interns". In June 2023 we welcomed 15 interns as part of the programme across the business. Our aspiration is that after completing placements, successful candidates will progress onto developing their careers with United Utilities or our supply chain.
- 4.4.17 The safety of our colleagues has been, and always will be, a top priority for us, and we are pleased to have delivered sustained year-on-year improvements in employee accident frequency rates for the last five years. In recognition of our commitment to health and safety, we have been awarded the Royal Society for the Prevention of Accidents (RoSPA) gold standard medal for the 11th consecutive year.

Figure 10: Ben Read, National Professional Young Engineer of the Year by the Pump Centre



¹unitedutilities.com/corporate/newsroom/latest-news/united-utilities-engineer-scoops-national-award/

4.5 New, dedicated teams for growth areas

- 4.5.1 We have created new, focussed Capital Delivery Directorates to deliver Clean Water, Waste Water and Better Rivers (including CSOs). These directorates are there to prepare and optimise the delivery of programmes in each of these areas of activity and investment.
- 4.5.2 The Better Rivers directorate is bringing particular focus to rapid delivery of improvements on storm overflows as well as bringing focus to key AMP8 priorities on rainwater management and nature-based solutions. This is allowing us to commence design and build-only work early, thus building confidence in our programme both internally and externally in the supply chain;
- 4.5.3 In Section 5 of this document we describe the results of our analysis from the Internal Capacity and Capability Assessment. As a result of this we have also set up a dedicated Rainwater Management Team and are currently midway through a recruitment process for a team of technical specialists to provide solutions for rainwater management such as natural flood management using permeable paving, swales and rainwater gardens. This was a direct result of our early analysis of capability of internal resources.
- 4.5.4 Additionally, following our AMP8 readiness review, we are significantly increasing our smart meter installer capacity.
- 4.5.5 Investment for AMP8 and further to AMP9-12 is of such a scale that we have set expectations with our delivery partners that they should invest locally in developing graduates, interns and local resource so we have a degree of future proofing in the North West and grow our local experience and expertise.

Growing support from our supply chain for specialist resources

- 4.5.6 We recognise that in some specialist areas skills will be more appropriately sourced from our supply chain, and these resources will be sourced as set out below.

Specialist consultants from the supply chain

- 4.5.7 Our procurement process for AMP8 includes securing capacity for specialist consultant resources across design engineers, programme management and control, commercial & quantity surveying, and estimating. These expert consultants will assist in supplementing permanent internal staff, and we will utilise external consultant resource to efficiently manage workload. They will be based within United Utilities locations working alongside us, seamlessly and collaboratively sharing and transferring knowledge to help us build internal capability and assist in upskilling the United Utilities team. We believe this will provide the necessary agility and adaptability to manage within a changing environment.

Engineering and design partners

- 4.5.8 Following our review and impact assessment we know the bulk of the external resources required for AMP8 come from the engineering and design disciplines. We already have a highly capable internal engineering function which is already one of the largest in the sector. We also have one of the world's largest and most respected engineering consultancies engaged as our Engineering Services Partner for AMP7.
- 4.5.9 Working together they can deliver both the upfront engineering works on the accelerated AMP8 programmes whilst continuing to support the successful delivery of the remainder of AMP7. We have 3 industry-leading specialist engineering partners appointed to AMP7 frameworks already for specialist hydraulic modelling services and we will use them to optimise solutions for the CSO programme. We also have access to 12 other globally recognised engineering consultancies who have been appointed to our Dynamic Procurement System, and with whom we can engage to meet any supplier or customer demand challenges.

Strategic design support - appointment of Strategic Solutions Identification Partners for AMP8

- 4.5.10 United Utilities' new AMP8 delivery model involves the appointment of 2 Strategic Solutions Identification Partners (SSIP) who will take the responsibility for identifying the most optimal solution to meet a project outcome and provide sufficient engineering resources during peak workload periods to

satisfy demand. The procurement process for these partners has already commenced, and 6 of the world’s largest engineering consultancies have submitted firm bids in response to the tender. We describe more about the new delivery model and the role of the SSIP in Section 5 of this document.

Additional design development partners

4.5.11 We also require additional engineering support to develop designs in a standardised, efficient, productive environment. We already have 11 of the industry’s most recognised and respected engineering consultancies registering firm interest in bidding. Our strategy is to use standard designs and processes as much as practicably possible. It is expected that these partners will harness design automation and artificial intelligence (AI) to produce design details and solutions in a highly efficient way. We have successfully trialled this approach during AMP7 with our incumbent partners and this approach will be scaled up significantly to deliver AMP8.

4.6 Thinking local, acting local and building local partnerships

Regional and Place Based Planning – Five Counties Approach

4.6.1 We’ve built our plan for the next five years around the five counties of the North West, as each is different with its own particular challenges and opportunities. Through embedding this approach we know we are delivering the right outcomes specifically tailored for customers in the places where they live. Our plan sets out the steps we believe we need to take to support a stronger, greener and healthier North West. Throughout the plan we've applied a regional lens to reflect the needs for each of the five counties that make up the North West.

4.6.2 Because thinking and delivering locally is important for successfully delivering AMP8, we’ve been working with stakeholders and customers to develop our understanding of unique needs at a local level across the sub regions of the North West so that we can develop plans that are more relatable to the communities we serve. We have created Stakeholder Managers and Regional Delivery Managers for each of the counties who will be the driving force in ensuring the benefits of our collaboration with local authority departments, regulators and specific interest groups and ensuring we are responsive to local concerns in formulating the details and executing delivery of the plan.

Figure 11: Five counties of the North West



Partnerships

4.6.3 We have built strong relationships with a wide range of stakeholders that work across geographies and community interests including local government, environmental and social charities, businesses and academic institutions. We have experienced the benefits of working in partnership over the past decade and there are many examples of this in the supplementary document *UUW38 – Working in Partnership*.

4.6.4 This is important because partnerships will be important in unlocking barriers to the timely and efficient delivery of the AMP8 programme. They can also help us deliver the necessary cost efficiencies to deliver our plan alongside additional benefits and successful resolution of shared

challenges; one example of this is the pioneering work we have delivered in the Petteril catchment (see Deliverability Case Study 3 below).

- 4.6.5 This case study demonstrates how partnership working on a local / county basis brings significant benefits to multiple stakeholders, communities and the environment, whilst ensuring we're delivering the best value for our customers. Multi-sector collaboration can support better needs prioritisation, the work helps co-create a long term vision for geographical areas and is fundamental in facilitating evidence-driven decisions. This all combines to create greater environmental and social outcomes for an area. In the case of Petteril, the partnership working has hugely accelerated our delivery plan for this Cumbrian area and we are now harnessing all of that fantastic learning into our approach to place based plans for AMP8 and beyond.
- 4.6.6 Our bold plan for partnership aims for well over half a billion pounds of investment in partnership approaches that will ensure lower costs and greater benefits for customers in the period 2025 to 2030. Through our Advanced WINEP proposal we aim to create the flexibility to unlock earlier, innovative investment and partnerships on rainwater management and storm overflows. The programme will drive £247 million of investment of which £197 million would be enhancement cost allowance and the remaining £50 million leveraged from partnership funding to deliver wider benefits, enabled by removing conventional regulatory barriers of timeframes, geography and penalties to allow us to flexibly co-plan and co-deliver with stakeholders. Information can be found in our Advanced WINEP submission, Chapter 6 of our PR24 main submission and supplementary document *UUW38 – Working in Partnership*.

Deliverability Case Study 3: Pioneering partnership working enhances deliverability of Cumbrian River Health Improvements

The River Petteril is a tributary of the River Eden, located in Cumbria (Figure 12). The local ecology is impacted by phosphorus pollution that is caused by everything from wastewater discharges, decentralised systems like septic tanks to agricultural and land management sources. This resulted in a regulatory requirement under the Water Framework Directive (WFD) to reduce levels of phosphorus, with the aim of achieving 'good' ecological status in the catchment.

In 2016, we worked alongside the Environment Agency, the Eden Rivers Trust and local stakeholders to carry out a 17-week catchment wide monitoring survey. The survey revealed that in order to positively impact the amount of phosphorus in the

River Petteril, we needed to not only look at our own processes but also work alongside partners and fellow contributors to transform the ecological status of the river through a catchment-wide approach

A new way forward

Based on the evidence collected, we understood that we had to tackle the problem in a new way and we applied our Catchment Systems Thinking Strategy (CaST²) in the Petteril, with the aim of working with others to address specific catchment needs in a more sustainable and holistic way.

What has that approach delivered?

The UK's first Catchment Nutrient Balancing (CNB) trial was initiated at Calthwaite wastewater treatment works (which discharges to the River Petteril) in 2019. This trial aimed to remove 150kg of phosphorus load through an

Figure 12: River Petteril home of our first Catchment Nutrient Balancing Solution



² unitedutilities.com/corporate/responsibility/stakeholders/catchment-systems-thinking/

innovative integrated catchment and treatment works solutions – in turn creating a 9% reduction in phosphorus in the catchment area against initial baseline.

The trial saw us work with other sectors such as agriculture, businesses, and environmental NGOs to deploy wider catchment measures such as hedges, buffer strips of vegetation and sediment ponds - delivering greater value for customers, communities, and the environment.

The three-year trial proved to be a success. In 2022, it achieved a 63% reduction in the phosphorus level in the catchment, according to measured data. The catchment impact, however, was six times greater than the initial target when wider catchment measures were also established.

While it is unlikely all the load reduction was delivered exclusively from the interventions funded by us, it does evidence the enhanced benefit that can be achieved with an integrated approach that engages all sources of pollution within the catchment. The project was awarded the Water Industry Forum's Environmental Innovation Award at their 10-year anniversary in 2022 in Leeds, acknowledging the environmental benefits and cost savings delivered by the project (Figure 13).

Figure 13: Collecting the Water Industry Forum Award



The CNB trial enabled us to engage with a wide range of partners in the catchment to create a long-term vision for the Petheril, with the vision of a resilient catchment where the environment and communities can thrive. We have invested £13.5 million to achieve greater environmental outcomes for the area and in collaboration with Nestle, we have piloted nutrient trading and catchment markets through demand-led models (Landscape Enterprise Networks) to deliver joined-up investment in the catchment.

We have taken key learnings from this approach and linked up with our Partnerships and County Plans approach to enhance the deliverability of our plan.

5. Engaging, expanding and building the supply chain

5.1 Understanding and assessing our supply chain risk

- 5.1.1 We recognise that a key part of any successful delivery strategy is the strength of the relationship with the supply chain and the degree and timeliness of access to contractors and suppliers. Effective and successful relationships with our supply chain are essential to delivery of our ambitious programme, the scale of which presents significant opportunity for the market. We have reviewed supply chain capacity through undertaking an extensive programme of engagement promote and raise awareness of the scale of opportunities in AMP8. This has helped us obtain feedback from the market to inform our procurement and delivery strategies. We also continue to be recognised for our engagement with our existing supply chain through our United Supply Chain supplier collaboration strategy.
- 5.1.2 Having understood both our programme requirements and the external environment we have thoroughly assessed the impact and risks of the AMP8 investment in the context of our existing internal capacity and capability and in terms of the requirements we will have from the supply chain.
- 5.1.3 In January 2023 we submitted documentation to the Environment Agency setting out our proposed WINEP options development solution. We highlighted the capability and capacity constraints that would increase deliverability risks of the programme.
- **Supply chain capacity** given the increased demand for labour and materials at a time of scarcity, increasing input costs, and competing demands from other large-scale programmes such as green energy provision;
 - **Efficiency of solution and intervention design** given the limited timescales for implementation;
 - **Green solutions** may be difficult to fully realise taking together the innovation required in their design, the limited expertise and experience available in the supply chain and the ambitious timeframes for deployment envisaged;

Supply Chain Deliverability Risk heatmaps – Pre-mitigation

- 5.1.4 We used a heatmap approach to assess the risks of delivery within our supply chain and United Utilities' ability to support the supply chain both in terms of capacity and capability. We also assessed the attractiveness of our runways to the supply chain as part of this exercise. The heatmap in Figure 14 represents the initial, pre-mitigation, position, based on a qualitative assessment of the associated risks using a Red-Amber-Green scoring for high, moderate or low risks to the deliverability of the AMP8 plan. Our assessment was carried out prior to any AMP8 readiness or mobilisation work.
- 5.1.5 Our supply chain heatmap pre-mitigation is shown as Figure 14 below. This shows the then anticipated spend levels for AMP8 against the identified workstreams, alongside equivalent spend in AMP7 to demonstrate the scale of growth and better illustrate the potential challenges to deliverability.
- 5.1.6 The initial (pre-mitigation) heat map showed some areas of moderate (Amber) risk, arising mainly from the need to significantly ramp up workload for delivery. However, these were also areas where United Utilities has considerable experience and expertise and established delivery models can be scaled up by adding more partners.
- 5.1.7 Higher risk areas (Red) included CSO Grey and Green Solutions. The risks here were not just supply chain risks, but also reflected risks in our own capability.

Figure 14: Our supply chain risk assessment (heatmap) – pre-mitigation activity

| Workstream | Delivery model | AMP7 spend (£m) | AMP8 anticipated spend (£m) | Incumbent supply chain turnover (£m) | AMP8 PIN respondents' turnover (£m) | Supply chain (capability and capacity) | UU (capability and capacity) | Attractiveness to the Supply Chain |
|---|---------------------------------|-----------------|-----------------------------|--------------------------------------|-------------------------------------|--|------------------------------|------------------------------------|
| Non-DPC "special" projects (>£100m) (includes Wastewater non-infra treatment works upgrades - complex projects) | Large Tier 1 Competitive Tender | 450 | 750 | Competitive Tender | Competitive Tender | Yellow | Green | Yellow |
| Design & build delivery (includes Water and Waste complex projects; infra and non-infra) | Large Tier 1 | 1,000 | 2,472 | 4,325 | 18,877 | Yellow | Green | Green |
| Build only delivery (includes Water and Waste non-infra, low complexity projects) | Tier 2 & 3 | 100 | 950 | 1,339 | 2,202 | Red | Yellow | Green |
| CSO Grey solutions (includes Waste infra, low complexity projects) | Tier 1,2&3 | 100 | 1,900 | 5,664 | 21,079 | Red | Yellow | Green |
| CSO Green solutions (includes Waste infra Nature Based Solutions / Rainwater Management solutions) | Specialist NBS contractors | 20 | 500 | 737 | 2,075 | Red | Red | Yellow |
| Maintenance infrastructure | Tier 2 & 3 | 500 | 1052 | 1,070 | 1,452 | Green | Green | Green |
| Maintenance non-infrastructure | Model dependant | 500 | 528 | 1,339 | 1,339 | Green | Green | Green |
| Bioresources projects | Tier 1 & 2 | 200 | 200 | 1,070 | 1,070 | Green | Green | Green |

- 5.1.8 **CSO Grey Solutions:** This is a market where United Utilities has considerable experience, and we have previously designed and delivered large volumes of a similar scale of these solutions in AMP3. However, the scale-up in volume is so significant that the risk is considered higher for AMP8. In relation to work on CSOs, the key question we had to consider was whether there would be sufficient suppliers in the market to deliver the amount of work required, at the pace required, in view of the likely level of investment in AMP8.
- 5.1.9 A priority action for us has been to gather the market intelligence necessary to assess capacity risk and confirm whether there are sufficient numbers of contracting organisations in the market to deliver a programme of this size successfully. It was clear that to deliver these programmes successfully and efficiently, we would have to adopt a new approach and look for ways to both optimise delivery and attract the supply chain.
- 5.1.10 **CSO Green Solutions:** This is an area that our assessment showed we needed capability to be developed quickly – this risk is therefore marked as high. United Utilities does have experience in successfully delivering “green” solutions (such as wetlands, reed beds, Sustainable drainage systems (SuDS), rainwater separation, rain gardens, and swales) on a small scale in AMP7, but internal capability is limited, the supply chain is not yet well established to deliver at scale, and the anticipated ramp up in volumes is so significant that this is considered the highest risk from a capability and capacity perspective. We have traditionally worked with small landscape and rural framework partners for works of this type but have already commenced engaging with the market ahead of AMP8 to understand how capability and capacity can be scaled up quickly.
- 5.1.11 **Build-only delivery:** This is an area classified as “high risk” due to the Smart Metering Programme, the need to increase installs by 5.5 times compared to AMP7 and build extensive new capabilities to drive benefits.
- 5.1.12 The remaining workstreams were classed as lower risk (Green). This is where internal knowledge and capability are strong, workload levels are not projected to fluctuate significantly, and established supply chains are in place.

5.2 Market engagement in support of our delivery programme

- 5.2.1 As many of the delivery risks arise from the supply chain we recognised early the need to step up our engagement. This included going beyond our existing supply chain and engaging with a far larger number of potential partners. One example of the steps we undertook to secure this engagement was reaching out to suppliers who did not respond to our PIN notice.
- 5.2.2 Prior Information Notices (PINs) are the process through which we stimulate the market to let them know that a procurement is being initiated. The process is dependent on the supply chain seeing and responding to the PIN. Recognising this issue, we issued two PINs to the market in respect of our capital programme and made direct contact with those members of the supply chain who did not initially respond, highlighting the opportunity we were offering. As a result we received a very strong response with interest from 91 suppliers, 62 of which have not previously been direct suppliers to United Utilities.
- 5.2.3 We held nine supplier engagement events attended by over 250 company representatives from across all 91 suppliers. The events were designed to have full transparency in respect of the size and scale of the opportunities and to explain the delivery model and how each part of the supply chain could have a share in the programme of work. We also took the opportunity to help suppliers understand our commitment to a stronger, greener, healthier North West set against the backdrop that this level of investment will continue during the delivery of our long term plan.
- 5.2.4 In addition we held over 50 one to one workshops with our suppliers to explain what will make our AMP8 contracts an attractive proposition for them. The aim was also to understand their current capacity and capability, to gauge their appetite for growth, and potential for investment in resource, equipment and training within the North West to help us deliver our longer term plans. From this we gained confidence that our delivery model had the right balance in terms of capacity and capability to deliver our capital programme, as described in 5.3 of this document. As discussed in that section, and shown in Figure 15 below, we have received very positive feedback from suppliers in response to our extensive programme of market engagement.
- 5.2.5 Recognising one of our key growth areas, we also implemented a task team to focus on rainwater management solutions such as Sustainable Drainage Systems (SuDS), to understand more about the market, the supply chain, and the resources needed to be ready for AMP8. This intelligence enabled us to understand best practice across other sectors such as highways infrastructure. As a result of this targeted action we now have well informed sourcing and delivery strategies to secure capability in this critical growth area.

5.3 How feedback from the market has directly informed our delivery strategy

5.3.1 There were a number of key themes which were consistent across market engagement. Supplier feedback reflects how our procurement and delivery strategies have been informed by the supply chain to ensure our approach was cognisant of best practice and an attractive market proposition (Figure 15 and Table 2).

Figure 15: Supplier feedback received from our market engagement activities





Supplier feedback
[Direct feedback received from our suppliers]

“From the start of the launch of AMP8, we have felt engaged and informed. United Utilities has held senior Director level one to one meetings with our company, to explain the likely scope of works and AMP8 timescales.

We have attended a number of UU’s AMP8 presentations and workshops which set out their procurement strategy, proposed lots and timetable. As a potential new member of their supply chain, we were able to raise questions through an online Q&A process; this gave us confidence that the AMP8 procurement process was transparent and fair.”

John Farrell, Managing Director, United Living Infrastructure Services

“Our Senior Management found the Pre-launch Events 1 & 2 and the supplier workshops very engaging and worthwhile. We felt that UU took on board the feedback from our company and other SME organisations actively involved in AMP 7, so they have the opportunity to feature in the direct delivery of the increased number of Wastewater Capital Projects going forward in AMP8...

We were pleased to see that a Build-only Model has been incorporated in the AMP 8 Procurement Strategy. The Build-only Pre-qualification Questionnaire has now been received in the business and can confirm it is of extreme interest and will get our undivided attention.”

Tim Kilroe, Group Managing Director, Bethell

“It allowed us to get a real understanding of your next steps as business and see where we can assist and how we can develop and grow ourselves to assist you on the journey.”

Dan Bolton, Managing Director Water Engineering Services Ltd

“Having been through numerous client procurement processes over many AMPs, I found UU’s AMP8 Capital engagement approach to be a breath of fresh air and a different level to the typical engagement events. They organised multiple sessions over the last 12 months, providing significant information on their AMP8 plans, with each session building on the last.

The final engagement event detailed the many material changes that they are planning to implement in recognition of feedback provided by the supply chain at the various sessions.

I have not experienced a client engagement process which has been so transparent, inclusive, and authentic, with UU showing how they value the supply chain and demonstrating a genuine desire for us to influence their strategy.

I look forward with excitement to working closely with UU to deliver this exciting challenge for the benefits of the communities across the North West.”

Colin Kelly, Managing Director, Sapphire Utility Solutions

“We have found the opportunity for early consultation on the AMP8 programme refreshing. It is rare that the asset owners genuinely engage their delivery partners at this stage. We appreciate being offered insight into the planned programme of works, and the ability to help influence the best possible delivery model.

The process of continuous engagement, both as a collective, and on a business to business basis, has been excellent. It has allowed us to start thinking ahead and shaping our business to best support yours and your customers’ needs.”

Sam Atherton, Chief Commercial Officer, Network Plus

“United Utilities have undertaken a wide and expansive programme of engagement with across a broad spectrum of the supply chain ahead of their AMP8 procurement. The process has been on-going for ~18 months and been very much a two-way conversation between UU and interested parties of all sizes, seeking ideas, feedback and clarifications as they have developed their delivery models and commercial principles.

I have found the process refreshing in that UU have been most receptive to ideas and concepts that we have introduced from both other water clients (UK and internationally) and the wider infrastructure delivery markets that we operate in.”

Adrian Mercer, Director of Sales – Water, Jacobs

Table 2: Specific supply chain feedback areas we have taken action on

| Key Themes/Feedback from the supply chain | How the feedback was incorporated |
|---|--|
| Simplified procurement process | We have openly communicated our procurement process and timelines, accelerating and simplifying the process where possible. We have published contract documents early to allow suppliers maximum opportunity to review and to provide clarity on how the frameworks will operate on award. Feedback is that United Utilities is leading other water companies with respect to openness and supply of information. |
| Greater collaboration | We have implemented a delivery model which will create an ecosystem of supply partners who will be encouraged to collaborate through robust and aligned performance and incentive mechanisms |
| Simplified work allocations and batching - reducing mini competition | The intention is to direct award as much as is feasible to reduce mini bidding which slows down the award of work and introduces a cost burden on the supply chain. |
| Standard forms of contract | Historically the water industry has used standard forms of contract such as NEC with heavily amended terms. For AMP8 NEC standard terms will be used with minimal amendments. |
| Greater flexibility in the use of United Utilities asset standards | We are currently simplifying standards for AMP7 to provide greater flexibility in solution delivery and inform use of this more extensively in AMP8. This is also aimed at enabling standardisation of solutions to get faster, more efficient delivery. |
| Splitting of lots into “above ground” and “below ground” assets to allow specialist contracting | Our delivery model allows flexibility such that specialist contractors can be procured directly by United Utilities. This will open a gateway for more innovative solutions and avoid “fee on fee” incurred by procuring through Tier 1 partners. |
| Long term agreements that enable greater investment in people, skills, plant and systems | United Utilities are committed to giving guaranteed volumes of work and greater visibility on the upcoming pipeline to the entire supply chain. |

Supporting supply chain investment in growth in future AMPs

- 5.3.2 During supplier engagement we have communicated to the supply chain that current expectations of investment for AMPs 9, 10, 11 and 12 are of a similar scale to AMP8. This is providing confidence to suppliers that means they are better able to invest in their own capacity and resources for the longer term and will therefore generate more capacity within the market to continue to deliver our ambitious plans in future years.

Early Procurement

- 5.3.3 In order to ensure we engage the right supply chain elements to maximise the opportunities presented by our ambitious plan we developed an accelerated procurement programme, reducing tender timescales where possible, and publishing contract information early to ensure suppliers have the maximum opportunity to prepare and respond. This represents 70% of our AMP8 programme (an estimated £4.9 billion). Our expectation is to have more than 20 partner organisations in place by October 2024. This allows time for any preparation and on boarding to facilitate our ongoing early start activities.

Making United Utilities a Client of Choice for Suppliers

- 5.3.4 In a highly competitive market it is imperative that United Utilities are seen as a client of choice and that our supplier engagement practices are attractive to suppliers who are able to help us to meet our plan. We recognise the need to secure the right supply chain to deliver our plan but also to maximise other opportunities across our region in support of our six strategic priorities.
- 5.3.5 United Utilities provides transparency and access for the supply chain in how potential suppliers can win business and how we can do business better. Our website is an active resource for suppliers to find

upcoming opportunities, whether that is through the Bid Assessment Framework, our tendering opportunities, or an innovative idea. We have a dedicated area of our website³ to provide existing and potential suppliers with more information.

- 5.3.6 We encourage our supply chain to work with us to improve our ways of working, become more efficient and identify opportunities to collaborate.

Award winning supplier engagement and practices

- 5.3.7 The Energy & Utility Skills Group have recognised our Commercial function as having achieved their Procurement Skills Accord (PSA) standard in having the strong practices and commitments in place throughout our processes and systems (see Figure 16).

Figure 16: Our Commercial team receiving recognition from the Procurement Skills Accord



- 5.3.8 Developed and led by the Energy & Utilities Skills Partnership, the aim of the Accord is to create a sustainably skilled sector workforce, by recognising those who invest in skills through procurement processes and rewarding suppliers in doing so. The PSA has 5 key areas of focus in relation to training, the supply chain, promotion of skills development, continuous improvement and monitoring and reporting. As well as achieving the PSA award for

compliance in all 5 areas, United Utilities also won the award for Excellence in Supplier engagement. This was in competition against other utility companies and a key differentiator for United Utilities was our United Supply Chain supplier collaboration strategy.

- 5.3.9 As signatories to the Prompt Payment code, paying suppliers on time is an important part of our supplier engagement practice. We pay suppliers within 12 days on average, and in the last two years United Utilities has been awarded the Good Business Pays Fast Payer Award by the PSA. This was only awarded to companies who demonstrate good practice in fast and on-time payments to their smaller suppliers. Dealing with suppliers in a supportive way, and with high quality standards for interactions, ensures that United Utilities is an attractive client for all levels of the supply chain and will support us in ensuring we can secure the capacity we need to deliver in AMP8 and beyond.

"I formed Water Engineering Services Ltd in 2018 as I wanted a change and saw an opportunity to develop a turnkey solution business I felt was missing. I set out opening avenues offering Mechanical and Electrical services and as we grew, we developed a in house design and commissioning business and steel fabrication business resulting in 2 workshops to allow stainless steel and carbon steel segregation.

This allowed us to then make a huge step forward with United Utilities on the new framework for small works mechanical and fabrication and also motor repair. In our view this has been a massive success allowing a large number of projects for WES and UU to collaboratively repair and maintain failing assets. We have since stepped up this avenue of work and are now working on larger UU projects such as Eccles WWTW.

With WES Ltd offering the turnkey services we are currently engaged with UU and have managed to reduce spilling on one site and are currently designing solutions for 2 more flow related issues. Additionally, we are developing a DFMA product-based solution for Wastewater Treatment on UU sites. We are currently engaged in the UU AMP8 bids and have attended all the UU presentations which have been greatly received by us with the

³ unitedutilities.com/corporate/about-us/governance/suppliers/about-our-service/how-to-win-business/

whole team being so welcoming and supportive answering questions on the day giving timelines and guidance for expectations.

We are very keen to progress this avenue of work with UU as a growing SME and working direct for UU has always been a clear process with good communication allowing us to manage cash flow better.

With the growth of WES Ltd we have created 50+ jobs in the northwest and have also created apprenticeship opportunities and developed our own training schemes with local colleges taking on T level students in our Fabrication and Design businesses allowing these students to gain real life experience. We support our community in many ways from Cumbria to south Mersey such as sponsoring local community and sports groups, commissioned a memorial wall to remember a local WW1 war veteran and raising significant funding for charity donations such as our engagement with the Sedulo foundation.

I feel working with and direct with United Utilities allows us to really develop our sustainable business and we are looking forward to growing over the next Amp as a team, focused on creating a next generation of engineers."

Voice of the Supplier – A testimony from one of our SME suppliers, Water Engineering Services.

United Supply Chain (USC)

- 5.3.10 United Supply Chain is our strategic supplier engagement strategy and is an effective means to generate collaborative, responsible supply chain management and deliver our Environmental, Social and Governance (ESG) principles effectively throughout our supply chain. USC plays a fundamental part in our engagement with the supply chain to achieve our purpose as it seeks to mitigate risk, build resilience, improve compliance, assurance and ultimately deliver better value within a high quality supply chain.
- 5.3.11 In 2022 United Utilities was shortlisted for a CIPS Awards for this approach, demonstrating how we remain at the forefront of industry thought leadership on collaboration with supply partners. More information can be found on our website⁴.
- 5.3.12 United Supply Chain and United Utilities' demonstrable commitment to ESG principles further contributes to our attractiveness to the supply chain as a client organisation. Many of the suppliers we engaged in our extensive market engagement process share a similar ethos and want to work with clients who will support and maximise the community and environmental benefits associated with their investment. USC provides a platform for suppliers to collaborate with United Utilities and with each other, again this is welcomed by suppliers who are keen to engage on key topics such as Carbon and Social Value.
- 5.3.13 As part of USC we have engaged over 150 suppliers to help build upon knowledge and deliver sustainable skills development. In July 2023 we held our first face to face round table event focused on tackling scope 3 emissions and this was well attended by 40 suppliers across 25 organisations ranging from capital suppliers, to chemicals, facilities management and critical goods like pumps.
- 5.3.14 USC also offers support to those suppliers who may need to upskill in this area. In partnership with the Supply Chain Sustainability School we have developed tailored learning modules which are fully aligned to our Responsible Sourcing Principles. Training is offered free to our supply chain as our specific topic focussed knowledge sharing forums and events.
- 5.3.15 USC will be supporting AMP8 deliverability by promoting a collaborative supply chain culture, thereby making us a client of choice and building sustainable skills for the future in conjunction with our supply chain. As well as our website, more information on our plans for USC in AMP8 can be found in supplementary document UUW50 – *Ensuring value for customers through the use of markets.*

⁴ unitedutilities.com/corporate/about-us/governance/suppliers/delivering-value/united-supply-chain/

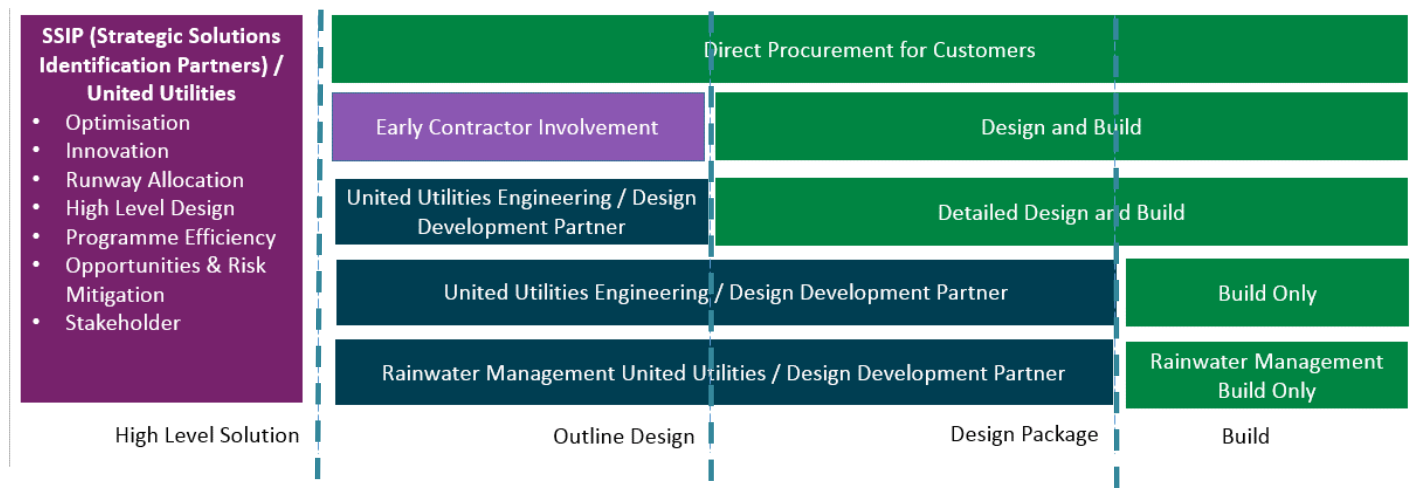
Identifying and implementing a new delivery model

- 5.3.16 Anticipating the increase in capacity needed for AMP8 delivery, we recognised a need for a new agile delivery model. In doing this we actively sought to understand our past performance to both build on our areas of strength and to learn lessons from areas where issues have occurred. We also looked beyond our own performance so as to build on lessons learned from across the industry and relevant lessons from other sectors.
- 5.3.17 Our extensive supply chain engagement told us our suppliers wanted more flexibility and simplicity in their route to working with us. This new delivery approach is part of our response to address the challenge and we see this as a great opportunity to attract a wider range of partners to work with us.
- 5.3.18 In view of the size and diversity of the capital programme for AMP8 and the feedback from our supplier engagement we took the decision to move away from the approach in AMP7 where we principally delivered the programme through “Tier1” Capital Delivery Partners (CDPs). This served us well but with the increase in size of AMP8 we decided that better value for money would be achieved by contracting directly with smaller “Tier 2” partners for less complex work, and also to provide the opportunity for specialist contractors to have a direct relationship with us. Opening up these routes will make us a more attractive partner to work with and as such considerably expand the capacity of our supply chain.
- 5.3.19 Considering all of those things we developed a “runway” approach which would provide opportunity for the right partner to deliver the right project dependant on size and complexity.

Our new delivery model – utilising 'runways' to deliver our programme

- 5.3.20 Figure 17 below sets out the various delivery routes that we will have to deliver projects of different types, different scale, and different levels of complexity and risk, also identifying where design involvement is required.

Figure 17: Our New AMP8 Delivery Model



- 5.3.21 The model has five delivery routes to support the broad and diverse supply chain we will need to deliver our plan:
 - **Direct Procurement for Customers (DPC)** – Discrete large-scale investments to be independently procured outside of our capital programme. This delivery route is explained in more detail in supplementary documents *UUW52* and *UUW53*.
 - **Early Contractor Involvement / Design & Build** – large scale, high complexity infrastructure projects (c. £10m to £100m) that can be tendered out to the supply chain early in the project lifecycle, utilising design capability and innovative ideas from the supply chain.

- **Detailed Design & Build** – Schemes that will be developed to outline design by the United Utilities engineering function and/or design development partners before being tendered, enabling United Utilities and the supply chain to agree risk allocation prior to contract award.
- **Simple Build Only** – Lower complexity schemes which will be developed to complete solution before appointing the contractor.
- **Specialist Rainwater Management Build Only** – This specialist delivery route will procure those solutions which will be developed through to complete solution and are likely to require access to specialist supply chain.

5.3.22 Table 3 below outlines our assessment of the numbers of projects and indicative values that we assessed as likely to be progressed by each runway, which we have shared with supply chain partners.

Table 3: Anticipated volume through each of the runways

| Work type | Number of projects | Indicative project (£) | Total anticipated programme (£) |
|--|--------------------|------------------------|---------------------------------|
| DPC | 1-2 | >£200m | c£350m |
| Very large non-DPC | 2-3 | >£100m | c£750m |
| Complex Design & Build (process/non-infrastructure) | 80-100 | c£10m-£75m | £1.75bn-£2bn |
| Complex Design & Build (networks/non-infrastructure) | 20-30 | C£10-£75m | £200-£300m |
| Build-only (process/non-infrastructure) | 250-300 | c£500k-£10m | £650m-£850m |
| Build-only (networks/non-infrastructure) | 350-400 | c£500k-£15m | £1.75bn-£2bn |
| Rainwater management (inc.NBS) | 200-220 | £2mC | £500m+ |
| Total | | | £6.0bn-£6.8bn |

Appointing Strategic Solution Identification Partners to help drive best value for customers

5.3.23 To support us in the delivery of our plan we are appointing two Strategic Solutions Identification Partners (SSIP) under a newly procured framework. One SSIP will be for non-infrastructure requirements, the other for infrastructure. The SSIP partners will complement our strong in-house engineering capability, and support us in driving affordability and best value for our customers, while we deliver our commitments in the plan. The combination of in-house capability and global engineering specialism and expertise will give us flexibility and agility in the creation of our investment plans to maximise benefits from the delivery of AMP8. The SSIP will be incentivised to develop solutions that provide efficiencies and best value to deliver environmental improvements, and minimise carbon emissions.

5.3.24 For example, this will include:

- Developing catchment based approaches
- Optimisation and enhancement of our existing assets to deliver improved performance
- Leveraging innovative new technology, as well as nature based solutions
- Exploiting digital opportunities
- Supporting and maximising our approach to the standardisation of products

- Off-site manufacturing and modular construction

- 5.3.25 The SSIP will also support us in determining the most appropriate runway for delivering the solution, depending on its' complexity and risk profile. Our intent is to appoint SSIP partners that share our core purpose and will support our long term delivery strategy beyond AMP8.
- 5.3.26 The use of SSIPs will provide us with ready access to a global resource market. This allows us to mobilise across time zones with our standardised design strategy. This is an approach already used across other infrastructure based industries and has been proven to reduce pressure on local resources, allowing them to concentrate on more bespoke designs, and improve timescales. Our standardised design approach will allow for drawings and specifications to be drafted during office hours in the Middle East/Asia in time for comments, checking and approval once UK offices start the working day. Based on current employee levels within the supply chain this provides access to technical and delivery experts across 50 countries and can provide significant time savings across our AMP8 programme.

Undertaking a Capital Delivery Market Assessment

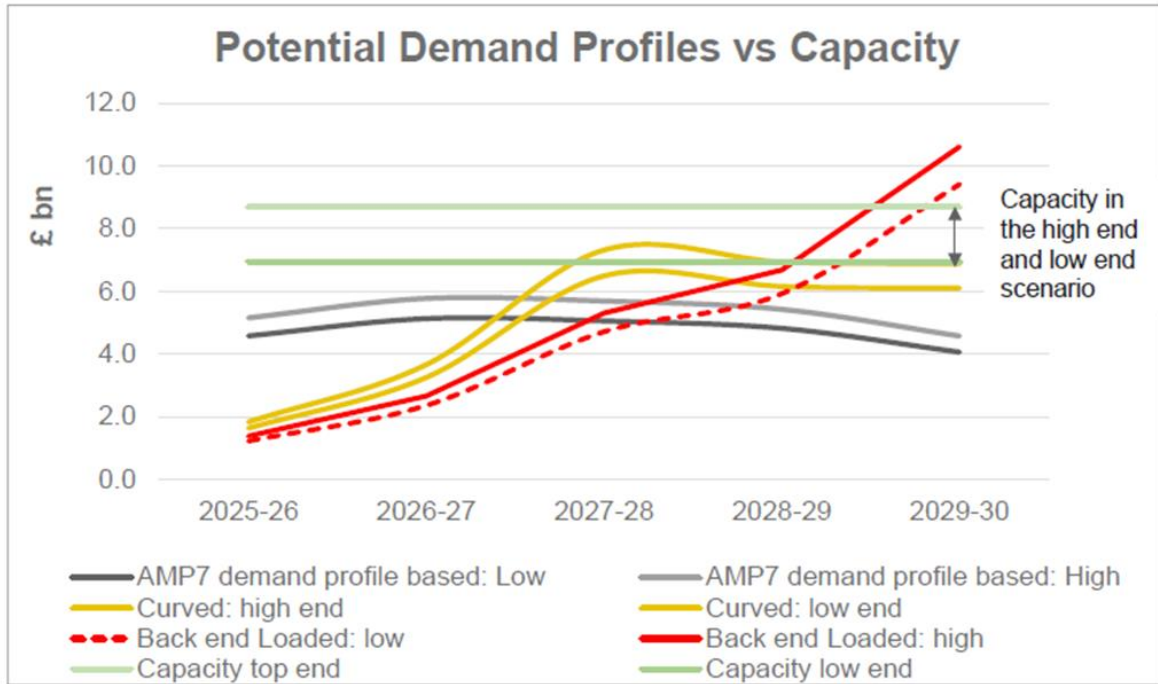
Sector Wide Capacity

- 5.3.27 United Utilities has reviewed market capacity throughout its engagement with the supply chain. It has also considered external assessments such as those made by Stantec in their *"Report for Water UK on AMP8 deliverability."* This report looked at capacity in both the design and the construction supply chain and identified sector wide risk associated with capacity to deliver all AMP8 programmes.
- 5.3.28 The report concluded that the capacity of the supply chain available to the water sector is in the range of £6.9 billion and £8.7 billion per annum. Total planned capital expenditure across the water industry in AMP8 ranges between £42.9 billion and £44.4 billion. Construction demand is estimated to be 60% of the AMP8 planned capex or £26.6 billion.
- 5.3.29 This independent study concluded that there is sufficient capacity available within the supply chain for AMP8 construction. However, as the spend profile for AMP8 is uncertain, the report assumed linear spend across the 5-year period 2025-2030 providing an annual construction demand value of £5.3 billion. To illustrate the impact of shifting demand on capacity, the report modelled alternative demand profiles. This analysis identified a potential industry wide capacity issue at peak demand and indicated there would be a high level of competition for resources.

Understanding the sector wide requirements has enabled us to be confident in our own ability to deliver the AMP8 programme.

- 5.3.30 At the time of our PIN, we asked the supply chain was asked to provide estimated volume of work they believed they could deliver for United Utilities during AMP8. Responses ranged from single digit millions of pounds in value to several hundred millions of pounds. This indicated there was sufficient capacity to deliver healthy competition, allowing a diverse supply chain to help mitigate the risk of being overly reliant on a Tier 1 supply chain. From this information United Utilities have decided to adopt routes to market, including direct procurement from Tier 2 and specialist contractors as well as the Tier 1 contractors.

Figure 18: Supply chain Potential demand vs Capacity for AMP8



Source: Stantec for Water UK, AMP8 Deliverability – Phase 3 analysis

- 5.3.31 Figure 18 above demonstrates the need to optimise the programme as far as possible to level out demand throughout the AMP. We understand this and have been working to optimise the programme to achieve this. We have already started our programme, supported by the accelerated approvals for our CSO investments through the Accelerated Infrastructure Delivery project. This supports us to smooth the demand profile over a longer time period, increasing the deliverability of our programme. The Accelerated Infrastructure Delivery project has enabled us to make an early start on one third of the overflows we expect to deliver improvements on during AMP8.
- 5.3.32 During our market consultation the 91 supplier organisations were asked to provide their estimated availability, in the form of estimated annual turnover and growth, against proposed United Utilities frameworks over the five years of AMP8. Figure 18 and 19 below show details of the resources available, from those 91 supplier organisations, against two of our runways, the "Design and Build" (Figure 19) runway and the "Build Only" (Figure 20) runway.
- 5.3.33 The graphs show that the supply chain is indicating that it has the capacity (represented by the green bars) to provide more than is required to achieve our forecast construction demand each year of AMP8 (represented by the red line on each graph).

Figure 19: Design and Build Market Capacity vs United Utilities anticipated programme

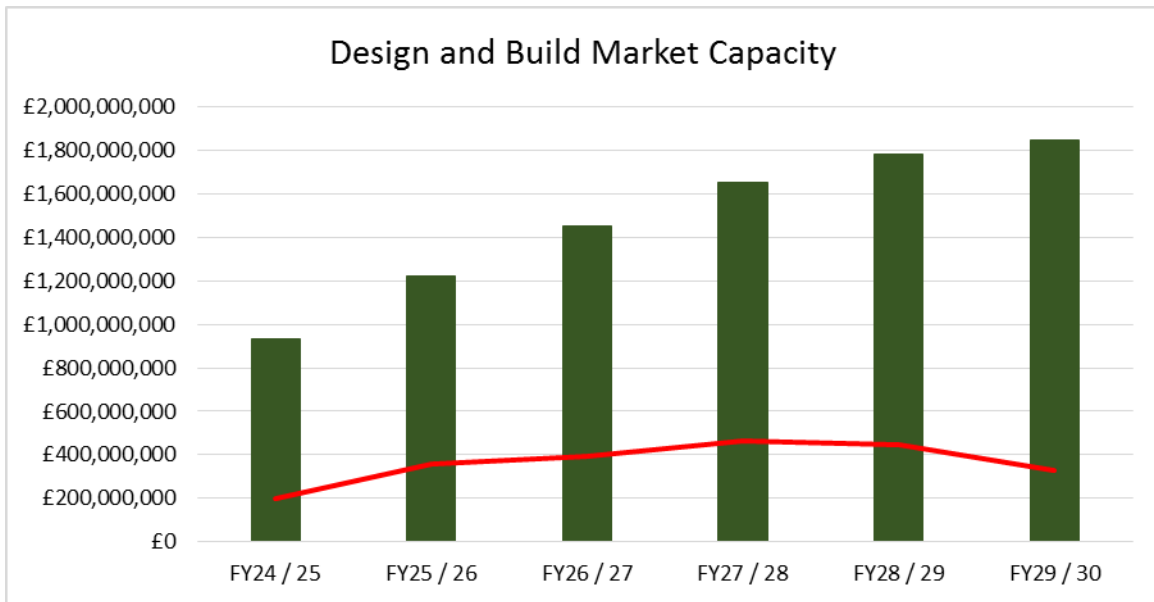
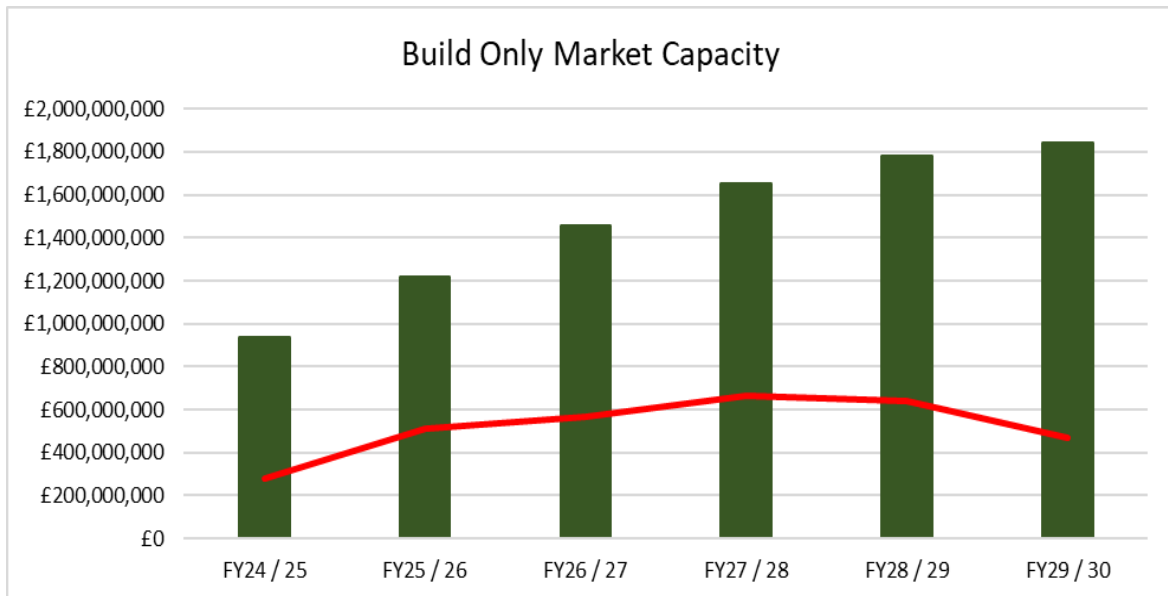


Figure 20: Build Only Market Capacity vs United Utilities anticipated programme requirements



- 5.3.34 We recognise, however, that these responses are from a larger number of construction organisations than we would usually contract with during delivery of an AMP. We have therefore started our framework tendering processes and detailed discussions with a significant number of these organisations, across multiple tiers, so that we are well placed to engage the supply chain and deliver construction to time once projects are confirmed and designs are complete.
- 5.3.35 We believe this approach will mitigate the risk of construction resources not being available when we require them as we are providing an early indication of when construction is likely to occur and providing a profile that steadily increases across the 5 year period. It also helps to counter the key industry wide risk identified by Stantec, in that by providing a clear profile of work and delivering this ahead of typical timescales, we help to avoid a capacity constraint later in the AMP.
- 5.3.36 Our market analysis indicated there was sufficient capacity to exceed the expected United Utilities demand and also deliver healthy competition. This is validated against the estimated capacity included in the Stantec report. This means a more diverse supply chain can help mitigate the risk of being overly reliant on a Tier 1 supply chain, providing direct routes to market for Tier 2 and specialist contractors.

Recognising the capacity of our supply chain for equipment and materials

5.3.37 In our review we have identified key pinch points in the supply chain with regards to skills, equipment and materials. These include - but are not limited to – smart meters, chemicals and river water quality monitoring.

5.3.38 Our early recognition of these types of challenge means we have been able to control and where necessary put in mitigation plans to ensure these risks are managed. We have carried out a detailed assessment of the procurement needs within our plan and where we have high volumes of items to procure. We have a bulk order plan to buy and free issue items with high volume within our programme in order to provide procurement efficiencies.

Smart Meters Programme

5.3.39 Smart metering is critical to delivering our Per Capita Consumption (PCC), Business Usage and Leakage targets in the Water Resources Management Plan (WRMP). In order to achieve these targets, we plan to increase meter installation volumes fivefold compared to today, in addition to building extensive new smart-enabled capabilities to drive benefits from the data smart (AMI) meters provide. Following our AMP8 readiness review we assess a potential risk with metering installing capacity and supply chain capacity. As a result, we are taking the following measures to ensure that we are prepared for AMP8 smart delivery:

- We are proposing transitional funding to procure a sizeable metering, communications and installation contract ahead of AMP8
- In advance of this tender, we are engaging closely with the supply chain to provide advance visibility of our plans and expectations to interested parties providing a new generation of communications network infrastructure and physical meters, in addition to the installation resources to deploy these. This is enabling our supply chain to factor our demand into their forward planning
- We are aware of concerns in the market regarding the significant increase in meter volumes required by water companies in England, coupled with the shift to AMI technology that is underway. Our plans represent circa 10% of the market's demand, and we are confident, given a) our staggered rollout profile across AMP8 and b) our market engagement with meter manufacturers and others to date, that there is sufficient diversity of supply for smart meters that our contracting approach will enable us to secure the meters we require in our required timeframes
- In readiness for this increase in volumes, we are also scaling up our meter installation resource pool

5.3.40 As part of our readiness activities, we are building on our existing meter operations capabilities to develop an enhanced meter deployment management team, who will:

- Ensure continued alignment between required WRMP outcomes and in-AMP to AMP9 smart rollout plans, which have been developed by our smart readiness programme team.
- Engage closely with wider stakeholders on whom the rollout will depend (e.g. councils).
- Align with other United Utilities and 3rd party plans and activities to coordinate potential impacts on customers (e.g. networks, lead pipe replacement, CSO work, fibre installation, gas main replacement).

5.3.41 A series of workshops have been held, covering Benefits and Future Operating Model, Procurement & Supply Chain, Deployment and Non-Household (NHH) considerations. The purpose of these workshops was to identify scope, key decisions, key questions (with preferred positions where possible), required activities and timelines to achieve our AMP8 smart rollout targets. These outputs, building on wider water and energy industry experiences of smart metering now form the foundations of our smart readiness programme.

5.3.42 We have secured meter supply for AMP7 from our primary meter supplier, however due to the increased requirements for AMP8, we are also mitigating the volume risk by sourcing from multiple

suppliers to meet the demand. Our full market tender process is underway and will be issued this calendar year.

Chemicals

5.3.43 Due to the increasing requirement for nutrient removal from wastewater in AMP8 it was recognised that there was a potential shortage of chemical supply for the UK water market. These include chemical coagulants and pH correction chemicals. To address this we led a significant consultation with our suppliers to establish how we could gain confidence in security of supply over the coming AMPs. This was critical in ensuring our capability to deliver our plan.

5.3.44 As part of this engagement we drove collaboration with other water companies in the sector, and established the two key requirements:

- Suppliers required long term agreements so that they could make the investment in more production capacity.
- Suppliers needed minimum guaranteed volumes from customers.

5.3.45 As a result, we built those requirements into our chemicals tender process and consequently we have met our security of supply needs for chemicals. In addition to this, by going out for a multi-lot framework covering various sites we achieved cost savings against our existing arrangements.

5.3.46 Other water companies have now put in similar arrangements, resulting in greater longer-term investment and development in the chemical industry and improved supplier relationships.

Continuous River Monitoring

5.3.47 Under the PR24 programme, United Utilities Engineering and Technology Services started work on the Continuous Water Quality Monitoring Requirement following the EA WINEP guidance released in July 2022. Through a multitude of different forums, United Utilities has worked with different organisations and suppliers within the sector to raise the challenges associated with the program such as; availability of sensors, a skilled workforce to install and maintain the equipment, land access, power and carbon impact. We have participated in the DEFRA working group to work through the challenges and provide proactive feedback on proposals and worked through a range of different scenarios to target a best value solution for customers.

5.3.48 Based on the August 2023 guidance we estimate that the number of monitors required has reduced from an initial baseline of 4,264 to a current estimate of 2,400. 600 are required in AMP8.

5.3.49 To mitigate some of the challenges we have engaged with a number of partners and reached out to the wider supply chain:

- United Utilities conducted early market analysis in December 2022 with a Prior Information Notice on Continuous Water Quality Monitoring Requirement. The PIN notice helped us understand the suppliers who are interested in supporting this opportunity, the different commercial and delivery models available to us and helped us start to validate cost estimates.
- United Utilities supported the Water Research Council Instrumentation User Group (WRC IUG) sessions on the matter to share knowledge with instrumentation SME's at the other waste water utilities.
- We supported and presented at industry collaboration events on the matter run by the Sensors for Water Interest Group (SWIG).

5.3.50 We are also working with our partners on innovative new solutions to meet the challenges and mitigate delivery risks. We are at various stages of maturity running a number of pilot schemes across the region to further understand the practicalities of installing, commissioning, operating and maintaining continuous water quality systems in rivers:

- Kiosk based solution pilot in Cheshire as per early DEFRA guidelines (Figure 21);
- Innovative sensor trials in Merseyside following our Innovation Lab in 2022;

- Innovative low maintenance fluorimeter technology installations in Cumbria; and,
- An alternative approach with drone based sensors in South Cumbria.

Figure 21: Continuous river monitoring - Kiosk based solution pilot in Cheshire



Conclusion

- 5.3.51 Since we first identified and assessed AMP8 deliverability risk, our Readiness Plan combined with measures set out around supply chain engagement, capacity analysis and generating appetite have significantly contributed to improving our risk position. We have:
- Identified the key supply chain risks, both at an industry and United Utilities-specific level
 - Taken active steps to engage with a broader supply chain, highlighted the opportunities and asked them to identify and plan for increased capacity. We have undertaken specific and targeted engagement with areas of the supply chain where we see particular capability and capacity risk such as SuDS
 - We have provided early visibility of short and long term needs, undertaken an extensive engagement programme and sought and acted upon feedback from the supply chain about how we should flex our procurement and delivery strategy. We are doing what we can to become a client of choice and to help the supply chain benefit from our strengths in ESG through our USC programme
 - We have introduced a new delivery model, utilising runways to deliver our programme, based on the advice received from Arup and the support for this approach from our suppliers
 - We developed and have implemented an accelerated procurement programme, aiming to have most partners in place by October 2024 and have made specific and timely interventions in specific supply chain pinchpoints such as smart meters, chemicals and continuous river monitoring.
 - We have invested in skills and resources to bolster our own capacity and encouraged the supply chain to do the same. We are working closely with SME suppliers such as WES Ltd to build their long term growth. At the same time we are contracting with Strategic Solution Identification Partners to supplement our own resources with global capabilities.
 - We have identified lessons that we can implement from other sectors, such as highways investment
- 5.3.52 Whilst it is inevitable that supply chain risks will evolve and further action will be required to manage these, we believe that we are well positioned, having moved early to engage, expand and build a more robust supply chain to support us into AMP8. As the next two sections describe, we are also using both asset standardisation and new innovation to further support deliverability of the plan.

6. Standardisation strategy to simplify deliverability

- 6.1.1 To aid the deliverability of the AMP8 plan we recognised that the supply chain would need confidence in the baseline of work expected through our programme. As part of this we have sought to proactively engage equipment suppliers in the development of standardised designs which would enable more work to be progressed via a build only approach and hence we could provide confidence in the programme size.
- 6.1.2 Through detailed examination of the AMP8 programme a targeted list of standard assets has been developed, and key supply chain partners identified to help to develop and deliver these. For example, we have developed a range of package chemical dosing plants in conjunction with its framework partner that allow all chemical dosing systems up to 10m³ to be covered with only two discrete designs. The standard asset designs are offsite built, repeatable and reliable.
- 6.1.3 The adoption of this approach brings multiple benefits including:
- Collaborative engagement with the supply chain to develop a rationalised suite of assets.
 - Value focussed designs developed with no bespoke aspects
 - Manufacturing expedience built into the design
 - Production efficiency in manufacturing
 - Advanced procurement of assets rather than procurement being project driven, thus providing the supply chain with a stable, consistent workload throughout the AMP cycle.
- 6.1.4 Within the design of the chemical dosing standard asset, sub components have been designed to be of modular construction with ease of manufacture, maintenance and construction at the forefront of our intent. Recognising the imperative to facilitate change we also identified an opportunity to utilise a new manufacturing technique to produce its dosing rigs which would be more cost effective.
- 6.1.5 Sometimes the cost of enabling equipment is prohibitive to supply chain partners. Therefore we have been purchasing some equipment such that the benefits of modular cost effective manufacture can be realised and the best value delivered to our customers. We have invested in the capability of our equipment suppliers to be able to manufacture and are looking to implement this further across other repeatable assets across the programme.
- 6.1.6 The deliverability challenges for AMP8 are not unique to United Utilities. United Utilities is thus an active member of the Standard Assets working group formed in collaboration with The Pump Centre, to share standard asset designs with other water utilities for the benefit of all. This allows us to adopt Standard Assets formulated by others and also expands our supply chain partners capable of producing the designs in-line with AMP8 programme requirements.
- 6.1.7 United Utilities is also exploring how Standard Assets can be adapted from external to the water industry, specifically from HS2, and the Manufacturing Technology Centre.

7. Embracing innovation to support deliverability

7.1.1 Embedding innovation will be crucial to our AMP8 delivery. We have hard-wired “being innovative” into our business plan, a constant pipeline of new ideas that can be sourced, tested and adopted to deliver enduring benefits for customers, communities and the environment. More detail on our approach to innovation is set out in supplementary document *UUW49 - Innovation framework and strategy*.

7.1.2 Our Innovation Lab is a sector-differentiator, which has proven to be effective to find and persuade new entrants to work with us. These highly disruptive suppliers give us extra delivery capacity and can be more agile and flexible than conventional supply chain. We use the Innovation Lab programme to find support on specific themes and it is in its fifth year.

7.1.3 In 2023 we aimed our latest Innovation Lab scouting on key challenges within our plan including the delivery of the Better Rivers, Better North West CSO programme, ways to reduce water demand, new ways to manage water treatment and our smart networks and low carbon construction. We have received 136 applications (our highest number ever) with over 100 as new suppliers to us. This market intelligence will help diversify our thoughts on “the art of the possible” and focus our efforts on those with the highest potential. Our Lab programme design helps us test new ideas quickly – failing fast and cheaply – and allows us to convert proven ideas into full adoption faster than others.

7.1.4 We are conscious of some of the challenges for delivery of our AMP8 plan and have these in a managed risk register. Our innovation efforts are supporting how we can mitigate these risks including the challenges of:-

- **Supply chain capacity** to deliver conventional solutions phosphorus removal schemes which form a large part of our WINEP Programme; mitigated by our standardisation programme but also our portfolio of innovative ideas that reduce reliance on the conventional supply chain. We have a number of trials underway including the use of electro-coagulation as a standalone system or integrated within septic tank solutions. One example of this is the Fujiclean trial at Glazebury WwTW described in more detail in supplementary document *UUW49 – Innovation framework and strategy*.
- **Unavailability of chemicals** used in conventional chemical dosing; as mitigation, our research portfolio is exploring new technologies that use alternative chemicals. Our project being run as part of the Ofwat Innovation Competition is investigating alternative treatment methods to reduce phosphorus in rural works has a workstream dedicated to discovering if we can switch from fossil-fuel chemicals with limited supply to plant-based solutions with a new supply chain and additional supply capacity. (See Deliverability Case Study 2 - Alt-P - in Section 3 of this document). We are already getting good results and sharing these with our project partners and will soon be able to share more widely with the industry. We are fast to move on innovation insight and have already identified AMP7 sites where these early findings could mean we can quickly adopt this solution, test the performance at scale and learn ahead of AMP7.
- **The increased scale of construction we’re looking to undertake** – We have a digital engineering strategy and are implementing innovative approaches to large programme delivery including AI tools for programme optimisation as well as digital design automation approaches and digital construction methods such as 3D printing mentioned (see Deliverability Case Study 1 in Section 3 of this document). We’re engaging construction partners with global reach are looking to gain insight from their experience both in and out of sector as well as using our out of sector partnerships such as that developed with HS2 to encourage further new ideas to manage this risk
- **Innovation adoption** - Testing and adopting incremental and disruptive ideas within our capital programme is mitigated by our Technology Approval processes and dedicated innovation teams to take a more agile and risk-based approach to considering and fast tracking innovation adoption, leveraging the benefits across the full delivery programme. It has senior leaders in our business on the board and facilitates internal client risk awareness and awareness of the mitigation plan as well as buy in to implementation.

We can find, test and adopt ideas faster with our dedicated process and teams

- 7.1.5 Our Technology Approval Board involves end users and our supply chain early so that adoption is simpler and accelerated. We engage with our supply chain so that delivery risks are fully understood and we support the relationship building necessary for effective contract awards and deliverability. This approval process enables us to move quickly on innovation ideas, smoothing the decision process whilst managing potential innovation risk. Our commitment to gathering intelligence from our network of scouts and testing early (where appropriate) means that we remove the uncertainty of new ideas from the critical path of our capital projects; we can go faster as a result.
- 7.1.6 This has delivered benefits in AMP7 whereby we have been able to quickly make a decision on complex innovation ideas, to prevent slowing the programme but to maximise potential innovation benefit, not only in AMP7 but also to leverage this further in AMP8.
- 7.1.7 We have a team dedicated to innovation within our capital programme that can connect our central Innovation Team, Commercial, Engineering and Capital Delivery efforts to consider new ideas together, leading to more adoption compared to other organisation models.
- 7.1.8 An example of the Technology Approval process, working in tandem with focussed and co-ordinated innovation effort from dedicated teams, is our fast review of Mobile Organic Biofilm technology enabling us to be the UK first adopters (See Deliverability Case Study 4 below).

Deliverability Case Study 4: Mobile Organic Biofilm (MOB) - Plant based innovation opens the door for more chemical-free phosphorus removal

Background

We are required to increase the treatment capacity of our works to meet more stringent permits. Additionally, as population growth and the impacts of climate change increase, flow and loads to our works increase. As a result, sites frequently have insufficient space for the footprints required to accommodate conventional solutions.

There is a rising concern over microplastics entering water courses and process emissions but the conventional solution Activated Sludge Process intensification technologies include plastic media furthermore conventional ASPs require the addition of chemicals for phosphorus removal; as described we need to reduce our reliance on chemicals and so are looking to more Enhanced Biological Phosphorus Removal (EBPR) schemes; MOB is an enabler to open up further EBPR opportunities as it reduces the footprint required.

Innovative solution

The Mobile Organic Biofilm™ (MOB™) is a ground-breaking process technology provided by Nuvoda. The process originated in the USA and has been trialled and demonstrated in a variety of settings across the world since 2017, including municipal wastewater treatment plants, a pharmaceutical plant, and a food processing plant. The technology has been exported all over the world but has not yet been adopted in the UK.

The technology works to intensify conventional activated sludge technology by introducing Kenaf, an organic media (Figure 22), to the ASP to create a hybrid fixed-film suspended-biomass process that also acts as a ballast to improve settleability. The Kenaf circulates freely through the ASP, final settlement tanks, and the RAS stream, and is separated from the SAS using drum screens.

We reviewed the opportunities that MOB presented, the potential for performance, operational and commercial risk, and any needs to further test the technology beyond the existing operational data. We have been convinced of the supplier claims and have moved to an accelerated adoption.

Figure 22: Image of the plant-based media (kenaf) used for MOB



Results

AMP7 – first UK adoption – Macclesfield WwTW planned for 2024

AMP8 – we are targeting significant whole life cost savings if proven

AMP10 – included in our adaptive plan for Davyhulme WwTW.

Using leveraged funding to accelerate innovation and new idea adoption

- 7.1.9 We have assessed the innovation needs within our plan and identified key topics for proposal for leveraged funding including the Ofwat Innovation Competition. United Utilities are leading almost 25% of the awarded funds, the highest allocation to a single water company (for more details see supplementary document *UUW49 - Innovation framework and strategy*).
- 7.1.10 Many of these projects we have successfully secured funding for as lead organisation are directly related to deliverability challenges within our plan, these include mainstreaming nature based solutions, alternative approaches to Phosphorus removal at rural wastewater treatment works (Deliverability Case Study 2) and Water Industry Printfrastructure (Deliverability Case Study 1). We are learning and sharing outcomes from these projects as they progress and utilising them to support deliverability of our plan.

8. Maximising opportunities to invest ahead of AMP8

Accelerated Infrastructure Delivery

- 8.1.1 United Utilities has been active participants in initiatives such as Defra's Accelerated Infrastructure Delivery project. This has put us in a great position to implement and develop our new delivery model thanks to the approval to accelerate our AMP8 CSO programme. We have formed a dedicated delivery team, which began operating in April 2023.
- 8.1.2 The programme is looking at a number of ways to accelerate and optimise delivery such as:
- **Modelling Work:** The programme is carrying out the modelling for 154 sites to allow for work to commence at an accelerated rate at the beginning of AMP8 and provide flexibility in the programme if works on a particular site are unable to progress. This will also allow us to rapidly deploy modular solutions for early spill reduction in 2023 & 2024.
 - **Standardised and modularised design:** All of the standard component parts are being examined to understand if standardised designs can be used to simplify the build and facilitate bulk purchase of items. This will provide an opportunity for early procurement of standard equipment and components for free issue to contractors, securing both long lead time materials and manufacturing time slots.
 - **Design Technology:** exploring the use of Artificial Intelligence and automated design tools, together with global design capability, to advance network modelling and detailed design.
 - **Early engagement through strategic partnerships** – We are leveraging the relationships being built in strategic partnerships to identify opportunities for collaboration and/or take advantage of other development in the area to deploy SUDS or other solutions.
 - **Build only solutions:** The CSO programme allows us to bring forward the Build Only delivery approach for AMP8, whereby design is delivered in-house allowing the engagement of Tier 2/3 contractors
 - **Organising geographical county hubs:** The work is being organised regionally to counties to enhance stakeholder engagement and allow focus on areas of local importance such as Lake Windemere Bathing Waters.
 - **Distribution centres:** The team are discussing options with distribution centres to store 'solutions in a box' (all the component pieces for a typical site in a pre-packaged unit) that can then be distributed out from the hubs, providing integrated storage, delivery, lifting and installation.
 - **Carrying out enabling works in house:** Using in house teams to carry out minor works to facilitate specialist and SME contractors to take on the work rather than needing to procure through Tier 1 contractors.
 - **Project tracking and reporting:** 'Real time' status tracking for construction and commissioning progress, by project, region and programme.
- 8.1.3 The CSO delivery team is undergoing rapid growth and building to core strength by December 2023, including resources transferred from existing experienced teams (as a result of our organisational restructure) and supplemented by external recruitment for specific roles where we believe we have capability and capacity gaps. The team have also taken in a number of apprentices and graduates with the intention of growing this as the team matures.

Rainwater Management through Nature Based Solutions

- 8.1.4 One of the objectives of the formation of the new CSO delivery team is to facilitate the delivery of Nature Based Solutions (NBS). The Thornton Flood Risk Resilience (Deliverability Case Study 5, below) is an example of how we have worked with a collection of stakeholders, including private developers, to

deliver a scheme that achieves multiple outcomes through natural flood management. We will be looking to replicate this best practice throughout AMP8. Our SSIP in particular will be looking at opportunities to implement NBS where grey solutions have been typically used.

- 8.1.5 We are also growing and sharing experience of delivering Nature-based Solutions and natural capital markets through integrating with the “Mainstreaming NBS” Ofwat innovation fund project led by United Utilities. We are committed to sharing learning with other areas across England and Wales to support and inform the water industry’s AMP8 delivery.
- 8.1.6 We also want to exchange knowledge with other companies who take forward a successful Advanced WINEP proposal so that collaborative lessons learned can be developed to support regulators and share best practice. The intention for our Advanced WINEP programme in particular is to look at opportunities that will require complex stakeholder collaboration that will facilitate delivery of these schemes in AMP9.
- 8.1.7 Recognising that the delivery of Nature Based solutions is immature in the water sector, we have been engaging with other sectors such as the highways to understand how they have developed their supply chain for the delivery of these types of schemes. A number of suppliers who have delivered these schemes have been taking part in our procurement engagement sessions and we are also in the process of procuring a specialist design partner for SuDS solutions to facilitate some of the accelerated works in the CSO programme.

Deliverability Case Study 5: Thornton Flood Risk Resilience through partnership working

Background

Thornton, near Blackpool, is a town within the River Wyre catchment. The natural catchment area is low lying, flat and saturated which results in elevated flood risk. Historically, there has been flooding from multiple sources, most notably in 2017 when fluvial, pluvial and sewer flooding occurred. There are water quality issues from misconnections and, for many years, it has been an ambition of the partnership to resolve this. The scale of capital investment required to install concrete storage tanks to attenuate storm flows was not cost beneficial per customer or environmentally sustainable to deliver.

The existing drainage system and its connection to sewers creates inefficiencies by decreasing sewer capacity and increasing pumping, resulting in unnecessary treatment at Fleetwood wastewater treatment works.

Our approach

In 2019, we identified the opportunity to collaborate with other risk management authorities, catchment partners such as the Rivers Trust, and the communities group of the Wyre Flood Forum, to develop a plan to solve the joint issues in the catchment through natural solutions. This included:

- collaboration through effective catchment partnerships to identify needs;
- examining how to store and purify flood waters through natural flood management;
- identifying multiple benefits for extra investment to compliment and deliver the Natural Course / Wyre Rivers Trust project;
- investment of £220k to Wyre Rivers Trust through bespoke legal agreements across Lancashire;
- 3.3 hectares of wetlands and 1,000m³ of flood storage at Hillylaid Pool; and
- 1,300m³ of storage and wetlands habitat constructed collaboratively with McDermott Homes.

Support for the project came from the EU LIFE funded Natural Course project.

By the close of 2020, we will have delivered the majority of interventions in the catchment, quickly and efficiently through the partnerships with the Rivers Trust and McDermott Homes. 2021 will provide an opportunity for the community to plant up wetland areas that have been created to realise the ecological benefits of this scheme.

Key learning points

- A catchment scheme was possible because we have strong and effective partnerships.
- Worked with developers to use land for flood risk management.
- Alternative funding from United Utilities help realise wider benefits.
- Monitoring the wetlands using dynamic telemetry will enable us to understand the catchment and to assess ecological improvement with input from local communities.
- Realignment of the old modified watercourse has restored the river back to a natural state.
- We will learn from our collaborations here and apply them across the wider strategic partnerships in the North West.

Advanced WINEP Programme

- 8.1.8 We are pleased to have been successful in securing approval for our Advanced WINEP proposal. This programme of work will unlock £249 million of investment in rainwater management solutions for storm overflows which goes beyond the work already planned for AMP8.
- 8.1.9 Our Advanced WINEP is a Rainwater Management Programme which will unlock earlier, innovative investment and partnerships on rainwater management and storm overflows. It focuses on unlocking rainwater management solutions in catchment areas where storm overflows need to be improved in order to meet Storm Overflow Discharge Reduction Plan (SODRP) targets after completion of the AMP8 WINEP. This programme will invest in 'best value' and 'least regret' actions, with a focus on driving rainwater management interventions which will reduce or eliminate the future requirement of investing in grey storage to meet the government targets.
- 8.1.10 The programme will drive £249 million of investment of which £199 million would be enhancement cost allowance and the remaining £50 million leveraged from partnership funding to deliver wider benefits, enabled by removing conventional regulatory barriers of timeframes, geography and penalties to allow us to flexibly co-plan and co-deliver with stakeholders. The interventions will vary but examples include rainwater gardens, swales, permeable paving, as well as natural flood risk management to attenuate flow upstream. This AMP9 accelerated funding initiative will help to unlock opportunities that would not otherwise have been possible.
- 8.1.11 The successful application for Advanced WINEP provides an early opportunity for United Utilities to secure and invest in the required resources with confidence, ahead of AMP8. It also provides a very strong foundation for further investment of this type in AMP9. By ramping up expertise and scoping earlier delivery, we expect to have a flatter AMP8 delivery profile and therefore a more deliverable programme overall.

9. Assurance and demonstration that we are ready to deliver

9.1 Independent assurance

- 9.1.1 To support the development of our proposals, we employed Deloitte to independently assess how effectively we had considered the overall deliverability of the business plan alongside any industry best practice and how this had shaped the overall direction of key elements of the delivery strategy. Deloitte assessed whether the approach we have adopted considers the commitment required across the industry as a whole to ensure the AMP8 ambitions. The following specific activities were conducted:
- Understand UUW's overview of the current delivery environment, and outlook on the upcoming delivery environment.
 - A review of UUW's demand heading into that environment.
 - Understand the external view of the environment and the demand of other companies in the industry
 - Understand UUW's overall assessment and approach.
 - Review the outcomes and the associated risks and issues.
 - A review of the mitigations and influencing factors
- 9.1.2 All actions from this review were addressed in the final plan and further details can be found in chapter 10.
- 9.1.3 Alongside the outcome of the WINEP challenge process and the Board's own review of our capital delivery and supply chain plans, this external assurance has supported the Board in submitting its Board Assurance Statement in support of the business plan submission.
- 9.1.4 To assess the deliverability of our plan we have applied the three lenses of Challenge, Capability and Capacity as shown in Table 4 below. This has ensured we have a plan we are confident we can achieve.

Table 4: Actions in response to challenge, capability and capacity

| Challenge | Capability | Capacity |
|---|---|---|
| Commissioned WINEP independent scrutiny and optimisation panel | Created new directorates with specific focus on new, growth areas such as CSOs and rainwater management | Undertook heatmap analysis to identify internal and external (supply chain) constraints |
| Secured support from leading organisations including Arup, Mace and Alvarez and Marsal to support our readiness programme | Recruited new design, delivery and commercial expertise with a robust ongoing resourcing plan | Created the right conditions for in-depth and detailed engagement with the supply chain |
| Considered the deliverability of our plan opposite the key tests outlined by Ofwat | Created new PMO capability focussed on programme optimisation and risk management | Engaged extensively across the supply chain to design a new delivery model that is fit for purpose for AMP8 |
| Undertook work with Deloitte to obtain an assurance review on our approach | Driving a localised, 5-counties approach to designing and executing the plan | Took active steps to mitigate supply chain risks for critical goods |
| | Using early start and advanced investment opportunities increases skills and capability ahead of time | Early commencement of AMP8 schemes in AMP7 helps increase remaining AMP8 capacity |

Challenge

- 9.1.5 We commissioned a WINEP scrutiny panel of established experts who have challenged us and supported optimisation of our plan. We have also brought in external expertise that has supported us to reorganise our business, cut out waste and to shape a large scale change programme which is driving our transformation. Additionally we have undertaken work with Deloitte to gain assurance about the robustness of our approach.

Capability

- 9.1.6 We are transforming our business ready for the significance of AMP8. We have put a readiness plan in place already and already mobilising our teams and supply chain ahead of AMP8 as a result of our early start funding programmes. We are recruiting new design delivery and commercial expertise and have a capability sourcing plan to secure new skillsets we've identified as critical to the delivery of our plan.
- 9.1.7 Recognising the challenge of the investment programme we have created a new state-of-the-art PMO capability focused on programme optimisation and risk management. We've also created new directorates with specific focus on change management (our Transformation teams) and in our growth areas such as CSO's and Rainwater Management. We're making good progress attracting new talent to these business areas.
- 9.1.8 To help support and drive deliverability of our plan we are maximising the benefits of our track record in partnerships and growing that into our flagship 5 counties approach.

Capacity

- 9.1.9 We have assessed our internal and external market capacity. As a result we have put a robust resourcing strategy in place to support the internal growth we believe we need to deliver on a programme of this scale.
- 9.1.10 Externally our market capacity assessment has led us to create a new fit for purpose and 'right size' delivery model for our capital programme which introduces the runway approach and has led to us engaging with a significantly larger supply chain
- 9.1.11 We have developed the detail of our investment programmes and have used this to identify key risk areas such as our supply chain capability and capacity that we are on track with managing and mitigating. We also understand critical goods and goods we need to secure in bulk and have put measures in place to secure these.
- 9.1.12 Our Engagement shows that the supply chain has significant appetite to help us deliver our plan, that they have the capability and capacity to do so but that we need to act fast to secure the necessary contracts and support these businesses to grown their capacity over the course of the AMP. We are on track with our procurement and with the aid of early start funding we be able to accelerate this approach.

Addressing Ofwat's tests

- 9.1.13 Through our readiness approach, market assessment and extensive engagement with the industry and supply chain in addition to our consistent objective review of our own delivery we are confident that we have fully addressed and responded to the specific deliverability considerations posed by Ofwat. Examples of how this has been achieved are shown in Figure 23 below.
- 9.1.14 Ofwat can be confident we have undertaken a thorough and comprehensive analysis and review with regard to the deliverability of our ambitions in AMP8. This includes acknowledgement of how different delivery is likely to be in AMP8 compared to previous AMPs, and how we will be working differently as a result of this, reflecting shifts in our own needs and that of the market place. We are secure in our ability to meet the challenges and maximise the opportunities of our ambitious plan and we look forward to working with our customers, stakeholders and suppliers in delivery of our vision.

Figure 23: Examples of how we have met key Ofwat Deliverability Tests

| | | | | | |
|--|--|---|--|--|--|
| <p>1. The ability of the company and its supply chain to expand its capacity and capability at the rate required to deliver the increased investment.</p> | <p>Implemented an organisational wide revised operating mode supported by ARUP 4.1.3</p> | <p>Investing in our people and skills to retain and attract the skills we need 4.4.3</p> | <p>Adopted a 5 Counties place based planning approach 4.6.1</p> | <p>Commenced procurement to appoint the right supply chain partners 5.3.3</p> | <p>Shared a long term view of investment to encourage growth across the sector 5.3.22</p> |
| <p>2. The impact of similar levels of growth across the sector and any overall sector and supply chain capacity constraints</p> | <p>Appointed an Independent Scrutiny Panel 3.2.1</p> | <p>Advanced WINEP and focus on Partnership Working 4.6.6</p> | <p>Two Prior Information Notices (PIN) issued to the market. Nine supplier engagement events and 50 workshops 5.2.2 - 5.2.4</p> | <p>Designed a fit for purpose delivery model to maximise market capacity and skills 5.3.16</p> | <p>Assessed the market to confirm capacity across the sector 5.3.32</p> |
| <p>3. Key supply chain risks and capacity constraints, such as the availability of specialist resource or components</p> | <p>Procurement underway for supply & design partners and specialist skills such as nature based solutions and smart metering 4.5.7</p> | <p>Extensive supply frameworks in place for critical equipment, materials and kit allows us to lock-in pricing and secure supply 5.3.37</p> | <p>Aggressively pursuing product and solution standardisation to allow a “design once, deploy multiple times” approach 6.1.1</p> | | <p>Leveraging innovation and seeking new ideas that can be sourced, tested and adopted 7.1.1</p> |

United Utilities Water Limited
Haweswater House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP
unitedutilities.com



Water for the North West