

August 2023

Water Breakthrough Challenge 3 Decision Document – May 2023

Ofwat

About this document

This document sets out the process we have followed for our Water Breakthrough Challenge 3 innovation competition (Breakthrough 3) and the reasons for our funding decisions.

We opened Breakthrough 3 in October 2022. We invited water companies, in partnership with others, to enter two streams of the competition.

- The **Catalyst Stream** made approximately £8 million available for entries valued between £150,000 and up to £2 million.
- The **Transform Stream** made approximately £30 million available for entries valued between £2 million and up to £10 million.

The Catalyst stream opened on 3 October 2022 and closed for entries on 8 December 2022. We announced the [11 winners](#) on 16 May 2023.

The Transform stream opened on 3 October 2022 and closed for stage 1 entries on 9 November 2022. Stage 2 opened on 8 December 2022 and closed for entries on 2 February 2023. We announced the [five winners](#) on 16 May 2023.

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1. Background

In our strategy, 'Time to Act, Together' (October 2019), we highlighted that innovation is crucial for meeting the profound challenges the sector faces in a cost-effective and sustainable way. These include climate crisis, more volatile weather, and population growth. Water is critical to every aspect of our lives, and we need to make sure the sector can continue to deliver reliable, resilient and safe water that is affordable for all.

Our price review framework already promotes innovation by setting water companies stretching targets and allowing them the flexibility to adopt an innovative means of delivery. We have been encouraged to see some companies demonstrate real ambition in this space. However, there remain significant untapped opportunities for companies to work with each other, the supply chain and those in other sectors to trial and adopt new practices and technologies to transform performance.

Our December 2019 decision document '[Time to act, now: driving transformational innovation in the water sector](#)' highlighted the need for:

- a shift in company culture;
- more effective joint working; and
- changing a general perception that the current regulatory framework does not sufficiently encourage innovation, particularly in the context of clear public health and environmental obligations companies must comply with.

We considered that the introduction of innovation funding and innovation competitions can help address these needs, along with other initiatives such as [Streamline](#) the regulatory advice service for innovators.

We set out our decision to make up to £200 million of additional funding available through an innovation competition for the regulatory period, 2020–2025 in our December 2019 document. Our decision was that funding would be provided through an increase in company revenues as set out in the 2019 price review and would be collected by water companies from their customers. Through the introduction of the Innovation Fund, our aim is to help the England and Wales water sector grow its capacity to innovate and meet the needs of customers, society and the environment, with funding targeted at tackling [key strategic challenges](#).

By targeting transformative innovation designed to address key strategic challenges and emphasising the need for stronger collaboration and partnerships across the sector and beyond, we believe innovation funding and innovation competitions will help accelerate change. In spring 2020, we consulted on [the design and implementation of the Innovation Fund](#) and in August 2020 we published our [decision document](#).

In November 2020, we announced that we had appointed Challenge Works¹ to lead the Innovation Fund delivery partner consortium and assist with the delivery of the Innovation Fund competitions for the pilot period.

In January 2021, we opened the first competition, the Innovation in Water Challenge (IWC). We made approximately £2 million available for entries up to the value of £250,000 each. In April 2021, we announced the [11 winning entries](#) for the competition and awarded £2.1 million.

In May 2021, we opened our second competition, the Water Breakthrough Challenge (Breakthrough 1). This competition made approximately £40 million available for entries valued at between £1 million and £10 million.² In September 2021, we announced the [nine winning entries](#) for the competition and awarded £36.1 million.

In October 2021, we opened our second round of the Water Breakthrough Challenge (Breakthrough 2). Following feedback from the water sector, we brought together elements from the IWC and Breakthrough 1 to provide a more unified and streamlined process for water companies and their partners to access the fund by creating two streams – the Catalyst stream and the Transform stream. This competition made approximately £34 million available for entries valued at between £100,000 and £10 million. In March 2022, we announced the [13 winners](#) of the Catalyst stream and for the Transform stream we offered eight entries funding and announced [seven of these winners](#) in April 2022. In total, Breakthrough 2 awarded £25.4 million.

In July 2022, we produced an [Innovation Fund end of pilot period report](#), to:

- summarise what the fund has achieved during the pilot period (January 2021 to June 2022); and
- set out recommendations for how to build on these early achievements and evolve the fund over the next three years.

The report informed Ofwat’s consultation on the future of the Fund, ‘Innovation Fund Consultation – Approach for 2022-25’. This was followed by Ofwat publishing its [headline decisions on the future of the fund for 2022-25](#).

In October 2022, we opened our third round of Water Breakthrough Challenge (Breakthrough 3):

- The **Catalyst Stream** made approximately £8 million available for entries valued between £150,000 and up to £2 million.

¹ Previously known as Nesta Challenges.

² Entries with a lower value than £1 million were permitted for smaller water companies and NAVs if requested.

- The **Transform Stream** made approximately £30 million available for entries valued between £2 million and up to £10 million.

The Catalyst stream opened on 3 October 2022 and closed for entries on 8 December 2022. We announced the [11 winners](#) on 16 May 2023.

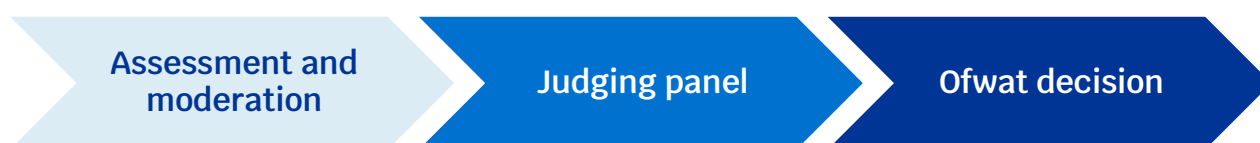
The Transform stream opened on 3 October 2022 and closed for stage 1 entries on 9 November 2022. Stage 2 opened on 8 December 2022 and closed for entries on 2 February 2023. We announced the [five winners](#) on 16 May 2023.

2. Breakthrough 3: Catalyst stream process

The primary aim of the Catalyst stream is to encourage new ways of working that go beyond business-as-usual innovation practices in the water sector, in particular, increasing and improving collaboration and building partnerships from within and outside the water sector.

The Catalyst stream sought all types of entries – for example technology, culture, business practices or commercial models. We were open to initiatives at any stage and sought to encourage the creation of new ideas and partnerships. It was focused on funding initiatives in accordance with the [aims of the Fund](#) (which include innovation enablers³) that deliver innovation in line with the [four strategic innovation themes](#).

For the Breakthrough 3 Catalyst stream, we put in place a one-stage entry and assessment process. Each entry was required to meet the eligibility criteria: that being that the lead entrant is a licenced water company or New Appointment and Variation (NAVs) in England or Wales; all entries must include a minimum 10% financial contribution; entrants agree to abide by the terms and conditions and entrants bid for between £150,000 and £2 million from the Fund.



Assessors reviewed each entry. Entries showing the most innovation potential, when assessed against the assessment criteria, advanced to the judging panel.

The table below shows the areas entries were assessed against at each stage of the process:

Table 1: Breakthrough 3 assessment areas

Assessment criteria areas	Weighting
1. Positive impact for water customers, society, and the environment	
1.1 Address a significant need or opportunity for customers, society and/or the environment	8.33%
1.2 Alignment with one (or more) of Ofwat's four strategic innovation themes	8.33%
1.3 Will, or could, be effective in addressing these problems or opportunities	8.33%
1.4 Set out a realistic reflection of external risks and how the potential benefits to customers, society and the environment outweigh these risks	8.33%
2. Innovation enablers and innovative solutions	
2.1 Use innovative approaches and/or solutions which would not be funded as part of business-as-usual and/or develops innovation enablers which accelerate practice beyond business-as-usual	22.2%

³ Innovation enablers include: collaboration, openness, adaptability, innovation risk management, scalability and deployability and long-term view.

2.2 Set out plans for adoption at scale across the water sector	11.1%
3. Capacity, capability and commitment to deliver	
3.1 Show commitment to the entry	6.66%
3.2 Will be delivered by a team with the relevant skills and experience	6.66%
3.3 Set out a realistic and achievable programme	6.66%
3.4 Demonstrate a realistic and considered costing which provides good use of customer funds	6.66%
3.5 Demonstrate a clear and proportionate approach to addressable risk	6.66%

Each area of assessment was weighted as per the table above and was accompanied by a set of questions that entrants were required to answer (see [Entrant Handbook](#)). Guidance was provided to potential entrants about what a successful entry could look like.

Each entry was assessed by three assessors with relevant knowledge and experience. Assessors were selected to ensure there was no conflict of interest with any entry they were assessing.

Entries were reviewed against the assessment areas shown in Table 1 by assessors separately, following which these assessments were moderated (including by reference to scores, qualitative review, and the requirement for a broad portfolio of bids) and a consensus agreed.

The Catalyst stream received 32 entries bidding for funding. Following a technical assessment phase, 18 eligible entries were shortlisted. Ofwat decided to add one other entry to the shortlist meaning that 19 entries advanced to the independent judging panel for consideration. However, the judges had access to all the 32 entries.

The judging panel recommended 10 of the 19 entries to Ofwat for funding. Ofwat considered the recommendations of the judging panel and decided that the 10 entries should be funded. Ofwat decided to fund a further entry with the additional funds made available from underspend on the Transform competition, totalling 11 entries to receive funding for Catalyst.

3. Projects selected for funding: Catalyst stream

We were encouraged by the number, quality and range of entries we received through the Catalyst stream of Breakthrough 3. As detailed above, all entries were assessed against the same criteria.

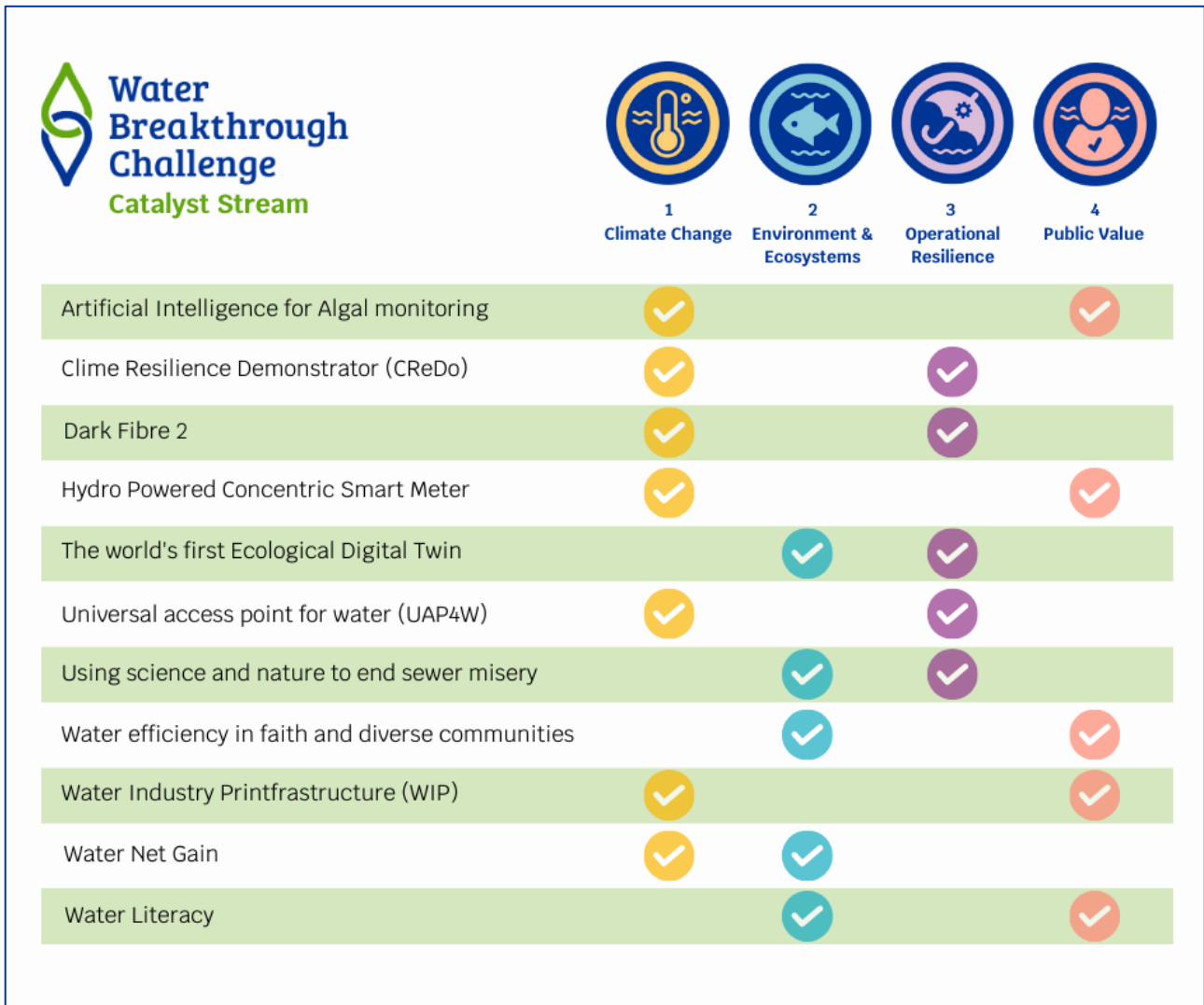
All the entries that will receive funding have met the eligibility criteria.

In making our decision on which entries should receive funding, we have considered the opinions and recommendations of the technical assessors and the independent judging panel. Each of the entries that are to receive funding have met the three overarching criteria (see Table 1) against which each of the entries were assessed.

We have considered all the entries received in the round to ensure that a broad portfolio of projects will be funded. The entries that are to receive funding align with our primary objective of Breakthrough 3 by offering a combination of ambitious innovation, and new approaches and ways of working. We consider that these entries best met our assessment criteria and outputs from the projects will help to equip the water sector to address the big challenges facing the sector and offer far-reaching and long-lasting benefits to customers, society and the environment across England and Wales.

We provide details of the 11 entries that will receive a share of £9.5million funding and the analysis which has enabled this decision below.

Figure 1: Winning entries by innovation theme (Catalyst stream)⁴



⁴ Themes impacted by entries as reported by entrants.

3.1 Artificial Intelligence for Algal Monitoring

Overview

Ensuring drinking water is safe to drink requires constant monitoring and prediction of risk. This is true for the water quality risks associated with algae and cyanobacteria e.g., taste and odour compounds which are predicted to increase with frequency and intensity with climate change. Traditional algal monitoring is time consuming, resource intensive and does not provide sufficient data for predictive modelling of algal risks. This project will use artificial intelligence (AI) to transform algal monitoring into a high-throughput, high-accuracy laboratory or field-based process for a fraction of the cost, allowing better risk prediction enabling water companies to take earlier, more cost effective and targeted actions. The project requests £385,159 in funding.

Project partners

This entry is **led by Welsh Water** with partners including igües Vic, Anglian Water, Bristol University, Cardiff University, United Utilities and Wessex Water.

Reason for award

The entry demonstrates a clear need which is significant within the water sector. It provides a thorough explanation of the impact on consumers, society, and the environment. One of the strengths of this entry is that the technology being proposed would have a preventative, rather than reactive, impact. For example, with near-real time data and many more data points, models can be improved to prevent, detect, and fight algal blooms at the earliest opportunity. The entry clearly identifies accessible, open-source mechanisms for the wider sector to adopt the technology.

Ofwat's decision

This entry will receive £385,159 of funding from Breakthrough 3.

3.2 Climate Resilience Demonstrator – Extreme Heat

Overview

This entry proposes the testing of a ‘biocatalyst’ capsule (using microorganisms) to remove ammonia with zero nitrous oxide greenhouse gas emissions and to scale up the process to a wastewater treatment plant.

The project requests £913,029 in funding.

Project partners

This entry is **led by Anglian Water** with partners including Connected Places Catapult (CPC), Computational Modelling Cambridge Limited (CMCL), UK Research and Innovation - Science & Technology Facilities Council (STFC), United Utilities Group Plc, Affinity Water Limited and UK Power Networks (Operations) Limited.

Reason for award

This entry has a clearly defined purpose, with both short-term and long-term goals. It demonstrates a clear understanding of the context and current landscape surrounding their proposed project. The entry also builds on past learnings by expanding on an existing model. It employs a systems thinking approach, driving cross-sector ways of working. Should the project succeed, it could deliver great benefits to the water sector and other utilities across the UK.

Ofwat's decision

This entry will receive £913,029 of funding from Breakthrough 3.

3.3 Dark Fibre 2

Overview

By 2030 the water industry must reduce leakage by 1 billion litres/day to ensure future water supplies. This requires step-change innovation that is more accurate and affordable than current leak detection tools. We can deliver this by using the fibre-optic cables already adjacent to water mains as leak sensors. This concept was demonstrated in the first catalyst funding round (Dark Fibre 1). This project, Dark Fibre 2, builds on this work to solve remaining challenges, prove at scale and build industry confidence. It will then be bought to market to enable deep reductions in leakage whilst keeping customers' bills low.

The project requests £1,332,205 in funding.

Project partners

This entry is **led by Severn Trent Water** with partners including Costain Group plc, Welsh Water, Focus Sensors, Northumbrian Water, Hafren Dyfrdwy Cyfyngedig and South Staffordshire Water.

Reason for award

This entry builds on a proof of concept which has positive results and demonstrates the potential to apply the proposed system on a wider scale. The project risks are effectively outlined and balanced against the potential benefits to customers, society and the environment. The activities are clear and well thought through with a robust monitoring plan in place. In addition, the entry includes a highly experienced project team with a likely ability to effectively deliver the intended outcomes. Should the project succeed, it represents high potential for cross-sector benefits.

Ofwat's decision

This entry will receive £1,332,205 of funding from Breakthrough 3.

3.4 Hydro Powered Smart Meter

Overview

Climate change is driving the need to conserve water as a key resource. Current concentric water meters can only provide very basic and occasional information as they are constrained by the limits of battery power. This project seeks to overcome this by using the flow of water to provide limitless power to the meter. This enables live, rich, data to be provided to the consumer and to utilities, enabling action to reduce consumption and prevent leaks. In addition to saving water, further sustainability benefits will arise from longer meter lifespans, reduced maintenance, and the elimination of environmentally harmful batteries.

The project requests £874,954.

Project partners

This entry was **led by Northumbrian Water** with partners including SUEZ Advanced Solutions UK, HYDRAO (Smart and Blue), Octo Design Ltd, PDL Solutions (Europe) Limited, Synthotech Limited, The Manufacturing Technology Centre Ltd, Southern Water Limited, South East Water Limited, Anglian Water Services Limited, Portsmouth Water Ltd and CRNS.

Reason for award

In this entry, the innovation is clearly identified, with outlined benefits in the short-medium term and the potential to act as an innovation enabler for hydro-powered tech in the long term. The outcomes of this entry have the potential to deliver benefits for customers, society and the environment through helping to achieve net-zero goals. The entry sets out calculated risks together with a well thought out delivery plan and clear recognition of what is needed to

achieve the outlined benefits. The entry involves a variety of partners with relevant delivery experience. The roles and responsibilities of the delivery team are laid out clearly with senior sponsorship's support is evident to help ensure the project's success.

Ofwat's decision

This entry will receive £874,954 of funding from Breakthrough 3.

3.5 The world's first Ecological Digital Twin

Overview

This partnership project will develop an ecological digital twin of one of Norfolk's iconic chalk streams, the River Stiffkey. The digital twin will turbo-charge the sector's response to river water quality to meet the evolving needs of customers, wider society and the environment. It will offer the ability to scale solutions to a major issue affecting customers and the environment now and in the long term, enabling new ideas and ways of working with partners from a broad range of sectors and perspectives. Taking an open approach, the project will generate learning for the benefit of all.

The project requests £1,200,000 in funding.

Project partners

This entry is **led by Anglian Water** with partners including Avanade UK Limited, Microsoft, Severn Trent Water, Wessex Water, National Trust, The Country Land and Business Association (CLA), Suffolk Sustainability institute – University of Suffolk, and Norfolk Rivers Trust.

Reason for award

This proposal will help to address the ambitions of the UK water sector to deliver long-term operational resilience, mitigating pollution and water scarcity in an innovative and sustainable fashion. The entry addresses an important unmet need of consolidating and merging fragmented data. The technology proposed could be used and re-adapted by others, providing a genuine opportunity for open learning and potential for scaling up. The entry demonstrates senior level buy-in to the delivery and capacity to engage. It is positive to see that all the partners are contributing beyond the minimum financial contributions required. The output of the project aims to provide actionable insights that will serve regulators and utilities and be a tool to engage further with communities.

Ofwat's decision

This entry will receive £1,200,000 of funding from Breakthrough 3.

3.6 Universal Access Point for Water (UAP4W)

Overview

Water companies in England and Wales have a challenging target to halve water leakage by 2050. In order to do this, they need an accurate understanding of the condition of the water mains and be able to carry out inspections and repairs without the need for expensive and disruptive excavations. This project will design a universal access point for water, which would provide a standardised entry point for pressurised water pipes. The access point will then be used for inserting cameras, leak location arrays, repair solutions, autonomous robotic solutions, and a host of other devices.

The project requests £224,010 in funding.

Project partners

This entry is **led by SES Water** with partners including Northumbrian Water Limited, Southern Water Services Ltd, United Utilities Group Plc, Thames Water Utilities, Water Research Centre Limited, The University of Sheffield, and Fluid Consulting Limited.

Reason for award

The proposal would lead to greater water accessibility and enable improved monitoring and detection technologies. The team demonstrates clear expertise and depth of knowledge in the area. The design is feasible, and the delivery mechanisms would be relatively quick, helping to increase its cost effectiveness. The proposed project has significant potential benefits to customers, society and the environment with many different stakeholders likely to benefit from the intended outputs. There is also a higher chance of this innovation being adopted more widely by the sector by including an open access design, rather than if it had been developed by a single commercial party and patented.

Ofwat's decision

This entry will receive £224,010 of funding from Breakthrough 3.

3.7 Using Science and Nature to end sewer misery

Overview

The entry started by looking at novel ways to tackle pollution events that are due to tree roots and the blockages they cause. The entry set out to scientifically prove that by repelling tree roots away from the sewer network, with a coating, that it will not affect tree growth. The innovative Root Defender coating will apply to the existing network, i.e. anywhere that is affected by the invasion of tree roots, thus providing a long-term solution to reducing pollution events. The entry outlined how this innovation could aid long term resilience of the network with this new approach to pollution reduction.

The project requests £939,377 in funding.

Project partners

This entry is **led by Northumbrian Water** with partners including United Utilities Group plc, United Utilities, Intelligent Gels, Thames Water Utilities Ltd, University of Durham, and The Centre for Process Innovation Limited.

Reason for award

The entry has a strong focus on environmental outcomes and leverages natural systems in its proposed solution. It also aligns well with multiple strategic innovation themes and is clear on how the benefits will be achieved. It sets out an innovative technological and developmental approach, distinct from business as usual. The entrants have appropriately identified potential risks and suggested realistic mitigation that will ensure benefits are delivered. The entry highlights a pressing need to address current solution strategies that are not effective and hold no long-term resolution. The entry provides a realistic and achievable alternative to this that could have wider reaching benefits across the UK water sector.

Ofwat's decision

This entry will receive £939,377 of funding from Breakthrough 3.

3.8 Water Efficiency in Faith and Diverse Communities

Overview

The project seeks to establish a deeper understanding on how water is used and valued in different faiths and cultures. The aim is to develop an evidence-based comprehensive water

efficiency engagement and support framework which water companies can adopt in the future. The project brings together a range of experts, academics, and faith groups to develop and introduce new bespoke water saving interventions and behaviour change campaigns linked to faith and culture. This could lead to significant environmental and social benefits, such as reducing per capita consumption for water, building public trust and value, as well as supporting hard to reach vulnerable customers by opening new channels of engagement and communication.

The project requests £270,000 in funding.

Project partners

This entry is **led by South Staffordshire Water** with partners including Waterwise, Severn Trent Water, South West Water, Affinity Water, Southern Water, Northumbrian Water, Get Water Fit, Hindu Climate Action, Eco Dharma Network, Cambridge University – Faculty of Divinity, and Cambridge Central Mosque.

Reason for award

This entry addresses an underserved problem in the UK water sector using a highly innovative, one-of-a-kind project idea. The project has the potential to particularly benefit a more diverse range of customers than is traditionally focused on. These communities can be underestimated during regular procedures. This entry includes an expert team and well-chosen collaborators ready to work on this project. It has a relatively modest financial ask for a project with potential to have a very usable output with practical recommendations and insights. The entry has great potential to move learning forward in this area and consolidate knowledge.

Ofwat's decision

This entry will receive £270,000 of funding from Breakthrough 3.

3.9 Water Industry Printfrastructure (WIP)

Overview

As technology for concrete and polymer printing has developed, so too have the opportunities for adoption within the water industry, particularly with regard to bespoke infrastructure designs. This partnership takes experience from current working practices in the rail industry and learnings from academia, and converts these to actionable, operational demonstrations for the industry. With the increasing requirement to provide more detailed, unique and often

resource intensive solutions, we believe we have a toolbox of options that will help the water industry and its customers plan and realise a more sustainable future for the implementation and maintenance of infrastructure assets.

The project requests £1,543,610 in funding.

Project partners

This entry is **led by United Utilities** with partners including ChangeMaker3D, Manchester Metropolitan University (PrintCity), and Scottish Water.

Reason for award

The proposed innovation would drive a much-needed step change and an opportunity to build resilience across the UK water sector. The entry provides detailed analysis on the need in question, the potential benefits of the proposal to customers, society and environment, and also the potential risks involved. The entry demonstrates a good understanding of the broader impacts and implications of the work, whether or not the expected outcomes are achieved. In addition, the team identified in the entry have the necessary skills to carry out the work.

Ofwat's decision

This entry will receive £1,543,610 of funding from Breakthrough 3.

3.10 Water Literacy

Overview

Water is significantly undervalued in society. The relatively limited public understanding of the systems involved in bringing water from source to use can result in inefficient use and pressures on water supplies. The entry aims to quickly raise awareness of the value of water and connect society's water use to the environment and its role in reducing the impacts of climate change. The Water Literacy Programme is an accredited learning experience delivered across all aspects of the community. It provides citizens with greater awareness and understanding of the systems involved and techniques to empower positive behaviour changes at home, in the workplace or in their community as well as signposting to further learning around water and climate change.

The project requests £864,484 in funding.

Project partners

This entry is **led by Northumbrian Water** with partners including Groundwork East, Waterwise Project, Northumbrian Water, DWR CYMRU CYFYNGEDIG, Portsmouth Water Ltd, South East Water Limited, Southern Water Services Ltd, Yorkshire Water, University of Denver, Consumer Council for Water, Consumer Scotland, The Environment Agency, Essex County Council, Kent County Council, Virtual College Limited, and Water Research Centre Ltd.

Reason for award

The entry clearly articulates the need and aims to provide a solution which explores wider factors than what is usually considered. It is innovative in the way it uses a framework which has proven to be successful elsewhere, for instance, carbon literacy. The project involves clear, tangible outcomes and goals, which can be measured. Additionally, the proposed programme allows for adaptability and continuous improvement. A diverse range of partner organisations are involved which allows for strong expertise and experience to inform the project and increase the likelihood of success.

Ofwat's decision

This entry will receive £864,484 of funding from Breakthrough 3.

3.11 Water Net Gain

Overview

Water Net Gain is a catchment-scale approach whereby farmers are paid to store water on their land. Restoring natural sponges, like healthy soils, woodlands and wetlands, can passively contribute water to summer base flows, but the creation of additional smart ponds and lakes, can be used for farm demand management or active releasing flows during droughts. The impact of this distributive ecologically connected water bank, released to the river during droughts, dilutes residual pollution not managed through current agricultural water quality incentivisation schemes. Alongside water purification, water retention solutions are designed to provide additional flood protection and aquatic biodiversity benefits.

The project requests £999,800 in funding.

Project partners

This entry is **led by South West Water** with partners including Westcountry Rivers Trust, Rivers Trust, South West Water, Duchy College, Environment Agency, Saputo Dairy UK, United

Utilities, Severn Trent Water, Anglian Water, Portsmouth Water (Advisory Panel only), South East Water (Advisory Panel only), and Southern Water (Advisory Panel only).

Reason for award

This entry aims to use nature-based solutions to integrate siloed but vital solutions, bringing together key stakeholders and to increase resilience as a result. There could be great benefit to the environment and biodiversity. The entry has the potential to bring out questions that need to be addressed and fed into policy decisions. The management of project risks is embedded in the entry's delivery plan, and the comprehensive monitoring and evaluation controls support this. The depth and breadth of the team, both in terms of time and financial commitment, gives confidence that the project outcomes will be delivered effectively.

Ofwat's decision

This entry will receive £999,800 of funding from Breakthrough 3.

4. Projects not selected for funding

32 eligible entries (totalling approximately £34 million in value) were competing for a share of the circa £8 million funding available.

Of the 32 eligible entries received, 21 did not receive Catalyst stream funding in Breakthrough 3. Feedback has been provided to each unsuccessful entrant with suggested areas of improvement should they wish to re-submit their entry to future competition rounds.

5. Breakthrough 3: Transform stream process

The primary aim of the Transform stream is to spark ambitious innovation and enable new approaches and ways of working; equipping the water sector to address the big challenges facing the sector, driving far-reaching and long-lasting benefits to customers, society and the environment across England and Wales now and into the future.

The Transform stream sought all types of projects – for example technology, culture, business practices or commercial models. We were open to initiatives at any stage and sought to encourage the creation of new ideas and partnerships. It was focused on funding initiatives in accordance with the [aims of the Fund](#) (which include innovation enablers)⁵ that deliver innovation in line with the [four strategic innovation themes](#).

For the Transform stream, we had a two-stage entry and assessment process. Each entry was required to meet the eligibility criteria: that the lead entrant is a licenced water company or New Appointment and Variation (NAVs) in England or Wales; all entries must include a minimum 10% financial contribution; entrants agree to abide by the terms and conditions and entrants bid for between £2 million and £10 million from the Fund.



Assessors reviewed each entry in stage 1. Entries showing the most innovation potential, when assessed against the assessment criteria, advanced to stage two. Entrants were required to provide more information in stage two where further assessment was undertaken.

The table below shows the areas entries were assessed against at each stage of the process:

Table 2: Breakthrough 3 assessment areas

Assessment criteria areas	Stage 1 Weighting	Stage 2 Weighting
1. Positive impact for water customers, society, and the environment		
1.1 Address a significant need or opportunity for customers, society and/or the environment	10%	6.6%
1.2 Alignment with one (or more) of Ofwat's five strategic innovation themes	10%	6.6%

⁵ The innovation enablers are: collaboration, openness, adaptability, innovation risk management, scalability and deployability and long-term view.

1.3 Will, or could, be effective in addressing these problems or opportunities	10%	6.6%
1.4 Set out a realistic reflection of external risks and how the potential benefits to customers, society and the environment outweigh these risks	10%	13.1%
2. Innovation enablers and innovative solutions		
2.1 Use innovative approaches and/or solutions which would not be funded as part of business-as-usual and develops innovation enablers which accelerate practice beyond business-as-usual	26.66%	22.2%
2.3 Set out plans for adoption at scale across the water sector	13.33%	11.1%
3. Capacity, capacity, and commitment to deliver		
3.1 Show commitment to the entry	10%	6.6%
3.2 Will be delivered by a team with the relevant skills and experience	7.5%	6.6%
3.3 Set out a realistic and achievable programme	2.5%	6.6%
3.4 Demonstrate a realistic and considered costing which provides good use of customer funds	n/a	6.6%
3.5 Demonstrate a clear and proportionate approach to addressable risk	n/a	6.6%

Each area of assessment was weighted as per the table above and was accompanied by a set of questions that entrants were required to answer – see [Entrant Handbook](#). Guidance was provided to entrants about what a successful entry could look like.

For both stages 1 and 2, each entry was assessed by three assessors with relevant knowledge and experience. Assessors were selected to ensure there was no conflict of interest with any entry they were assessing.

Entries were reviewed against the assessment areas shown in Table 2 by assessors separately, following which these assessments were moderated (including by reference to scores, qualitative review, and the requirement for a broad portfolio of bids) and a consensus agreed.

At stage one, we received ten entries bidding for funding. Seven of the ten eligible entries were advanced to stage two of the process. We invited four of the entries that received partial funding in Breakthrough 2 Transform to submit their entries directly to Transform stage 2, noting the potential disadvantage this would have for them without the feedback provided at stage 1. All four of these entries chose to accept. All 11 of the eligible stage 2 entries were assessed against the criteria in Table 2 and were advanced to the independent judging panel.

The judging panel recommended four entries to Ofwat for funding. Ofwat considered the recommendations of the judging panel and decided to fund five entries.

Each unsuccessful entry has been provided with feedback on its submission, and those that are to receive funding are required to sign a winner’s agreement prior to receiving funding.

6. Projects selected for funding: Transform stream

We were encouraged by the range of entries we received through the Transform stream of Breakthrough 3. As detailed above, all entries have been assessed against the same criteria.

All the entries that will receive funding have met the eligibility criteria.

In making our decision on which entries should receive funding we have considered the opinions and recommendations of the technical assessors and the independent judging panel. Each of the entries that are to receive funding have met the three overarching criteria (see Table 2) against which each of the entries were assessed.

We have considered all the entries received in the round to ensure that a broad portfolio of projects will be funded. The entries that are to receive funding align with our primary objective of Breakthrough 3 by offering a combination of ambitious innovation, and new approaches and ways of working. We consider that these entries best met our assessment criteria and outputs from the projects will help to equip the water sector to address the big challenges facing the sector and offer far-reaching and long-lasting benefits to customers, society and the environment across England and Wales.

We provide details of the five entries that have been offered a share of £32,181,872 funding and the analysis which has enabled this decision below.

Figure 2: Winning entries by innovation theme (Transform stream)⁶



⁶ Themes impacted by entries as reported by entrants.

6.1 Biopolymers in the circular economy (BICE)

Overview

This project is focused on the extraction and use of biopolymers to supply fully sustainable raw materials for the production of several high value products. The production and marketing of biopolymers from wastewater and sludge opens up opportunities to realise several routes to circular economies. It also supports the water industry in achieving Net Zero Carbon by 2030 by reducing our needs for manufactured polymers which we use in daily operational activities.

The project requests £6,149,362 in funding.

Project partners

This entry was **led by United Utilities** with partners including Aquaminerals, Cellvation, Cranfield University, Glasgow Caledonian University, Royal HaskoningDHV, Severn Trent Plc, South West Water Limited, United Utilities Water Limited, Yara.

Reason for award

This entry addresses a significant sector need and if successful could cause a genuine disruption of the biosolids market, advancing ambitions towards a circular economy.

It is high risk, but its aims are set out clearly and the delivery plan is sound, using proven delivery and governance models with a strong appreciation of risks and suitable mitigation activity. The delivery approach involves wide cross-sector engagement which is well aligned to the Fund's aims.

Ofwat's decision

This entry will receive £6,149,362 of funding from Breakthrough 3.

6.2 Designer Liner

Overview

This project focuses on reducing issues relating to and prolonging the lifespan of water pipes by adding an extra layer of protection. Pipe lining is 50% cheaper than more traditional methods, it generates less carbon and reduces disruption for customers because there's less need to dig up the road. Partners on the project will collaborate to develop a lining solution

that is fit for a 21st century water network and complements other technologies, like smart networks and devices.

The project requests £3,251,283 in funding.

Project partners

This entry was **led by Yorkshire Water** with partners including Dwr Cymru (Welsh Water), NCC, P. Clisham Consulting Ltd, RPS, Scottish Water, SES Water Plc, Thames Water Utilities Limited, Watershed Associates Ltd, WRc, Yorkshire Water Services Limited.

Reason for award

The entry identified a genuine and tangible problem for the UK water sector, and demonstrates a good understanding of this problem and this opportunity which takes a clear step beyond business as usual. The entry thoroughly outlined the potential benefits to customers, society and the environment, both in the short and long term, having a UK-wide scale and how it would lead to possible international opportunities. It also highlights the potential benefits should the project not succeed and the challenges they must first overcome in order for it to be a success.

The budget and timeline are well considered, appropriate and reasonable. There is a good level of financial commitment shown, and financial risk is shared across many partners. The team to develop the solution seems appropriate, providing multidisciplinary expertise, skills and knowledge not currently used in the water sector.

Ofwat's decision

This entry will receive £3,251,283 of funding from Breakthrough 3.

6.3 Mainstreaming nature-based solutions to deliver greater value

Overview

Nature-based solutions have the potential to provide multiple socio-economic and environmental benefits by tackling flooding, drought and water quality issues at landscape scale. This transformational programme of work brings together multi-sectorial expertise and leadership to collaboratively create and test new solutions to remove these barriers through real-life case studies and facilitate and enable transition of nature-based solutions into business-as-usual to deliver greater value for customers, society, environment.

The project requests £8,028,022 in funding.

Project partners

This entry was **led by United Utilities** with partners including Affinity Water Limited, Anglian Water Service Limited, Arup, Dwr Cymru Cyfyngedig (Welsh Water), Jacobs UK Ltd., Mott MacDonald Ltd., North Star Transition, Northern Ireland Water Ltd., Northumbrian Water Limited, Ribble Rivers Trust, RSK Group (ADAS, Salix, WRc), SES Water Plc, Severn Trent Plc, South East Rivers Trust, South West Water Limited, Southern Water Services Limited, The Nature Conservancy, The Rivers Trust, United Utilities Water Limited, Water Resources South East, Westcountry Rivers Trust, Wildfowl and Wetland Trust.

Reason for award

The exploration of nature-based solutions is an important strategic need in the UK water sector and has significant potential to enable breakthroughs in business-as-usual practices, with potential to effect changes in policy.

The entry demonstrated an impressive understanding of nature-based solutions and takes an ambitious step toward applying rich, innovative thinking from a more emergent area of knowledge and practice. The entry benefits from a well thought through and strong cross-sector team and steering group, which will help disseminate the findings of the work, and promote wider adoption. In addition, the key risks of the approach were clearly identified and matched with thoughtful, appropriate mitigation strategies.

Ofwat's decision

This entry will receive £8,028,022 of funding from Breakthrough 3.

6.4 A Net-Zero Hub

Overview

This ground-breaking project will transform a large, carbon intensive Wastewater Treatment Plant into the world's first retro-fitted carbon neutral site. Innovative suppliers are developing technologies to reduce, remove and avoid carbon. The plan is to integrate the most promising technologies on one site for the first time – creating the 'Net-Zero hub' – trialling them at scale to deliver a blueprint for water companies to retro-fit their wastewater treatment plants to achieve their stretching 2030 Net-Zero commitments. This bid covers the most innovative technology to target the biggest emissions.

The project requests £10,000,000 in funding.

Project partners

This entry was **led by Severn Trent Water** with partners including Aarhus Vand, ACWA (Nuvoda), Anglian Water Service Limited, Aston University, Atkins Ltd, Cranfield University, Dwr Cymru (Welsh Water), Explore AI Ltd, Irish Water, Melbourne Water, Northern Ireland Water Ltd., Northumbrian Water Limited, Scottish Water, Severn Trent Plc, Siemens, South West Water Limited, Southern Water Services Limited, SPRING, SUEZ Advanced Solutions UK, Thames Water Utilities Limited, United Utilities Water Limited, Wessex Water Limited, Xylem, Yorkshire Water Services Limited.

Reason for award

The technology proposed in this entry appears to represent a true innovation and addresses a significant need, which could be transformational if it achieves expected performance, with substantial scope to implement the technology across the water sector in England and Wales and potentially globally. The project has benefits which are likely to go beyond decarbonisation.

The entry articulates a strong understanding of the proposed technologies and how they will be implemented, assessed and the resulting learnings disseminated to the wider sector. It has strong and enduring support from senior sponsors, project leaders and partners.

Ofwat's decision

This entry will receive £10,000,000 of funding from Breakthrough 3.

6.5 Stream: Unlocking Innovation through Open Data

Overview

This project will unlock the potential of water data to benefit customers, society, and the environment. Stream will put in place technology and processes to remove the barriers to opening up and sharing water company data. Stream is not just focused on a single issue but will support hundreds of future data projects. The project aims to tackle the many tough challenges in the sector, and to use data to work with a variety of groups and organisations to overcome these challenges. The entry focuses on data collaboration as a key ingredient to drive innovation and improve sector performance.

The project requests £3,973,205 in funding.

Project partners

This entry was **led by Northumbrian Water** with partners including Aimi Limited, Anglian Water Service Limited, Costain Limited, Dwr Cymru (Welsh Water), Icebreaker One Limited, Open Data Institute Trading Limited, Scottish Water, SES Water Plc, Severn Trent Plc, Sia Partners UK Plc, South West Water Limited, Southern Water Services Limited, United Utilities Water Limited, Wessex Water Limited, Yorkshire Water Services Limited.

Reason for award

This entry built on a successful previous application with a thoughtful, well-specified methodology which set out the transformational potential of a such a large-scale project which will move the water sector forward significantly in the open data space and enable much greater innovation to take place.

The entry took a cross-sector approach to address a shared need for an open data ecosystem demonstrating buy-in from a large majority of the water companies in England and Wales at both strategic and operational levels. The entry balances feasibility with innovation, making use of existing technologies proven in other sectors and adapting this for the water sector, achieving good value for money.

Ofwat's decision

This entry will receive £3,973,205 of funding from Breakthrough 3.

7. Projects not selected for funding

In total, 14 eligible entries (totalling approximately £87.7 million in value) were competing for a share of the £30 million funding available. Feedback has been provided to unsuccessful entrants with suggested areas of improvement should they wish to re-submit their project to future competition rounds.

Of the 11 eligible stage 2 entries (totalling approximately £68 million in value), six did not receive funding in Breakthrough 3.

8. General areas of feedback for all entrants

A number of general areas of feedback identified during the Breakthrough 3 Catalyst and Transform stream processes are shared below to the benefit of all entrants to support entries (including those previously submitted) into future rounds. Stronger entries:

- more clearly evidenced the benefits the project would deliver to customers, society and the environment;
- more explicitly explained the innovative elements of the project and how it goes beyond business as usual to offer something transformational for the sector;
- provided a narrative to support the breakdown of costs in the template, for example, explaining where project components were costly;
- provided more detail on project plans to scale up and roll out the solution across the sector;
- as well as demonstrating a clear commitment to sharing project learnings, outlined a plan for how those lessons could/will be amplified and disseminated to the wider sector;
- better articulated an understanding of the regulatory frameworks which might impact the progress of the project or its potential to scale, now or in the future;
- better articulated the business case to provide more reassurances about the viability of the programme, including route to market consideration and cost contingencies such as inflation;
- provided a clearer explanation of the horizon scanning undertaken (including beyond the UK and beyond the water sector) to show how learning from others has been taken on board and will be built upon;
- conducted more stakeholder research/engagement/service design when looking at technology-based solutions to ensure this important stakeholder input was part of the considerations as they developed the solution;
- provided a more detailed approach to risk management, particularly given the amount of funding requested and for those solutions where the sector has demonstrably lower innovation maturity levels;
- clearly outlined the technology approach in non-technical terms to ensure that the entry had explicitly articulated what the proposal aims to achieve, detailing its objectives and intended outcomes, and;
- showed clear contingency plans to deliver benefits and learning even if the project failed.

**Ofwat (The Water Services Regulation Authority)
is a non-ministerial government department.
We regulate the water sector in England and Wales.**

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