September 2021

Water Breakthrough Challenge 1 Decision Document

Ofwat

About this document

In 2021, water companies, in partnership with others, have been invited to enter two types of competition with their innovations:

- A £2 million Innovation in Water Challenge (IWC) with the opportunity to receive funding of up to £250,000.
- A £40 million Water Breakthrough Challenge (Breakthrough 1) with the opportunity to receive funding up to £10 million.

The first round of the IWC opened on 18 January 2021, and Ofwat announced the winners of the challenge on 21 April 2021.

Breakthrough 1 opened on 6 May 2021, and we announced the winners of the challenge on 30 September 2021. This document sets out the process we have followed for Breakthrough 1 and the reasons for our decisions.

Contents

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 innovative means of delivery. And 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 technology to transform performance.

In December 2019, 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. Our decision was that funding would be provided through an increase in revenue at PR19 and would be collected by companies from their customers. Through the introduction of innovation funding and innovation competitions, our aim is to drive collaboration across the water sector and beyond with funding targeted at tackling key strategic challenges.

We have previously identified three key barriers to innovation in the water sector. 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 and more effective joint working, and 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. Global strategic challenges like the climate crisis and population growth mean it has become even more urgent for water companies to innovate in order to continue delivering safe, reliable and affordable water supplies for all.

We considered that the introduction of innovation funding and an innovation competition can help address these barriers. 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 our July 2019 consultation (Ofwat's emerging strategy: Driving transformational innovation in the sector) we proposed that access to financial support should be based on a number of key principles. Following the consideration of responses to this consultation, our December 2019 decision document included a set of innovation principles that are designed to help

safeguard customers interests, helping to ensure that we fund only transformational innovation that water companies would not otherwise explore or invest in. In our May 2020 consultation (Innovation funding and competition: further consultation on design and implementation) we consulted on minor amendments to these principles to reflect the evolution of policy. Our conclusions to the May 2020 consultation were published in our August 2020 decision document (Innovation funding and competition: decision on design and implementation), and included some amendments to these innovation fund principles. The final fund principles, which formed the basis for the development of the innovation fund competitions and the assessment of entries, are:

1. Innovation is not just about the development of new technologies. Innovation can also be developed by doing things differently and having the right systems, processes and people to support activities. A wide range of innovation proposals are encouraged, addressing the big challenges facing the sector and taking into account the strategic priorities and objectives of the UK and Welsh governments.
2. The purpose of the innovation competition is to drive transformational innovation that companies would not otherwise explore or invest in.
3. Proposals should be just as much about the roll-out of innovations at scale as the early incubation of new ideas and solutions. The innovation competition will fund a mix of both these approaches to maximise its impact. Where appropriate, we expect companies to set out clear plans for rolling-out innovations funded through the competition across their and other companies' areas.
4. Innovation fostered through the innovation competition must seek to provide public value for all customers in England and Wales, although the benefits for some customers may in some cases be indirect (e.g. solving problems prevalent in certain regional geographies can improve practices throughout the water sector, or from the sharing of findings across the sector where projects are not successful).
5. Companies will be required to demonstrate their commitment to innovation competition projects and ensure risks are appropriately shared between customers and water companies. This would include, as a minimum, a total financial contribution of 10% of project bid costs.
6. The innovation competition will run during the period 2020-2025 period, though some projects may extend beyond that period. We will review the effectiveness of the competition at least at the end of the period, and as required during the period.
7. Companies will need to provide evidence of how they are working together and with others (including other water and wastewater companies, their supply chain, companies in other sectors), and/or a commitment to transparent sharing of progress and findings with others within the sector and beyond.
8. There will be an open-by-default approach to data and learning generated through customer-funded activities, including where projects have been unsuccessful.

In November 2020, we announced that we had appointed Nesta Challenges to lead the innovation fund delivery partner consortium and assist with the delivery of the innovation

fund competitions for the pilot period. We set out in section 3 the process that has been developed and followed for the first round of the Water Breakthrough Challenge competition.

2. Breakthrough 1: process

Breakthrough 1 has been developed with the innovation fund principles, as set out in section 1, at its core. The primary objective of Breakthrough 1 was 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.

Breakthrough 1 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 initiatives and partnerships. Breakthrough 1 was focused on funding initiatives in accordance with the aims of the fund (which include innovation enablers[1]) that deliver innovation in line with the five strategic innovation themes.

For Breakthrough 1, we put in place a two-stage entry and assessment process. Each entry was required to meet the Breakthrough 1 eligibility criteria: that being that the lead applicant is a licenced water company; all entries must include a minimum 10% financial contribution; entrants agree to abide by the terms and conditions, including on IPR.

Breakthrough 1 process stages

Assessors reviewed each entry in stage one. 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 1: Breakthrough 1 assessment areas

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

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

Will, or could, be effective in addressing these problems or opportunities and outcomes are realised	10%	6.6%
Set out the range of possible outcomes for the entry, and the most significant inherent risks and uncertainties that may influence which outcomes are realised	10%	6.6%
Balance the potential benefits against the most significant inherent risks	n/a	6.6%
2. Innovation enablers and innovative solutions		
Use innovative approaches and/or solutions which would not be funded as part of business as usual	13.33%	11.1%
Develop innovative enablers which accelerates practice beyond business-as-usual (BAU)	13.33%	11.1%
Set out plans for adoption at scale across the water sector	13.33%	11.1%
3. Capacity, capability, and commitment to deliver		
Show commitment to the entry	10%	6.6%
Will be delivered by a team with the relevant skills and experience	7.5%	6.6%
Set out a realistic and achievable programme	2.5%	6.6%
Demonstrate a realistic and considered costing which provides good use of customer funds	n/a	6.6%
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 applicants were required to answer (see Entrant Handbook). Guidance was provided to applicants 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 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.

At stage one, we received 32 applications for funding. One entry was found to be ineligible. 23 of the 31 eligible entries were advanced to stage two of the process. 17 of the 23 eligible entries were advanced to the independent judging panel.

The judging panel recommended nine entries to Ofwat for funding. Ofwat considered the recommendations of the judging panel and decided that the nine entries should be funded.

Each entry will be provided with feedback on its submission, and those that are to receive funding will be required to sign a winner's agreement prior to receiving funding.

3. Projects selected for funding

We were encouraged by the number, quality and range of entries we received in Breakthrough 1. As detailed above, all entries have been assessed against the same criteria.

All the entries that will receive funding have met the eligibility criteria, agreed to the standard IPR arrangements detailed in the Terms and Conditions[2] and are consistent with the innovation enablers.

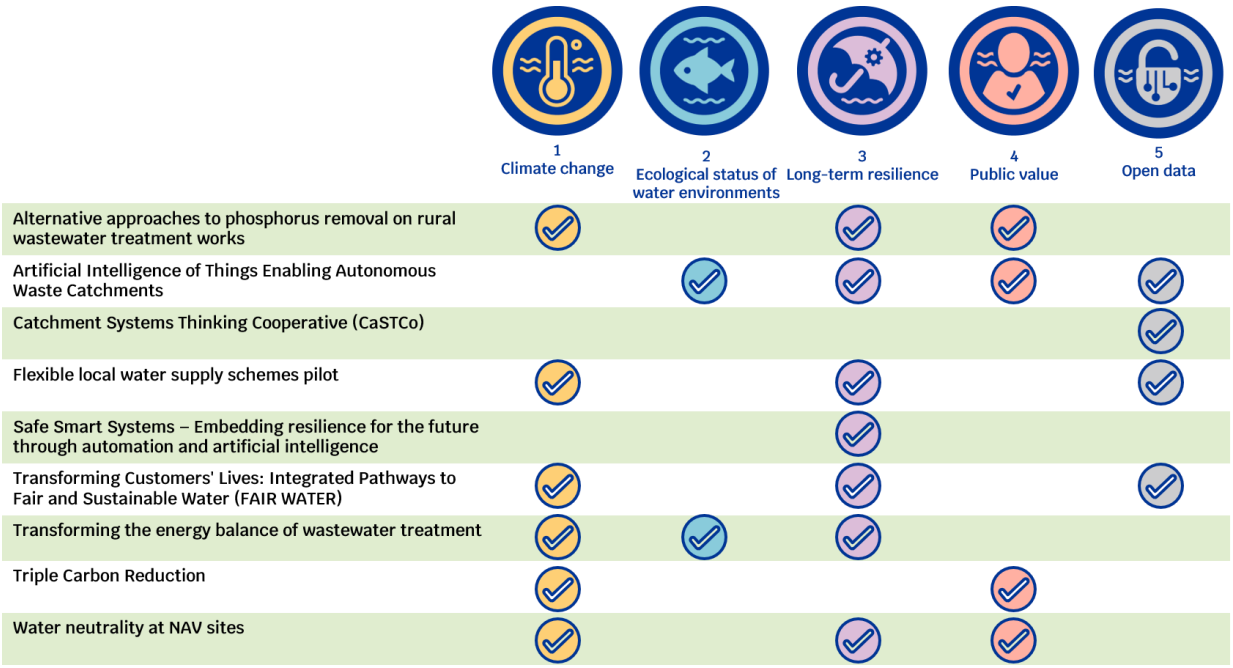
In making our decision on which entries should receive funding we have considered the opinions and recommendations of the technical assessors and the independent judging panel. Each of the entries that are to receive funding have met the three overarching criteria (see table 1) against which each of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

Ofwat has 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 1 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 entries that will receive funding and the analysis which has enabled this decision below.

[2] Because of the nature of the projects, we have accepted added clarifications on the meaning of background and foreground IP (which do not change the underlying meaning of these terms) for two of the winning entries.

Winning entries by innovation theme[3]



3.1 Alternative approaches to phosphorus removal on rural wastewater treatment works

Overview

This project will provide the water industry with a holistic view of the cost, capability, operation, maintenance and carbon impact of various phosphorus removal approaches, namely electrocoagulation, natural coagulants and reactive media. Through these trials this project will provide sufficient information to take the step forward into potentially more sustainable treatments than the metal-base coagulants used for the removal of phosphorus on rural wastewater treatment plants currently in use. The project requests £2,836,698 in funding.

Project partners

Southern Water Services Limited, Thames Water Utilities Limited, University of Portsmouth, Power & Water, Evergreen, Hydro Industries, Kolina. **Led by United Utilities**.

[3] Themes directly impacted by entries as reported by entrants.

Analysis of entry

1. Positive impact for water customers, society, and the environment

This entry clearly articulated a significant problem for the water industry that needs addressing, explaining how and why the proposed solution would offer a resolution. Current solutions rely on chemical dosing which does not align with other objectives. Offering a broad exploration of possible removal approaches which includes comparative side-by-side testing (a particular strength of the project) is something that should provide useful results. Although it would be beneficial to see initial indications on potential reductions in carbon dioxide or waste from the proposed solution.

2. Innovation enablers and innovative solutions

The initiative provides a valuable opportunity to carry out side by side testing of different phosphorus removal approaches and has a important rural focus. Outputs will be fully available to the industry, with a clear plan developed to share learning from this project widely and will enable a solution to this problem to be found that is relevant to the whole industry.

3. Capacity, capability, and commitment to deliver

The entry has evidence of commitment at senior levels and the project team is drawn from a wide range of partners (see above). The team proposed is strong and includes members with relevant skills and experience. This is of particular importance to this project of this type because any side-by-side testing will need to be carefully managed, with clear rules set about how the different technologies will be reviewed and scored. The project programme and plan are well thought out and realistic and include a logical governance plan which sets out how the entry can progress past specific milestones. The entry sets out how the project has the potential to address the challenges and opportunities identified, describing the possible outcomes and benefits well.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £2,836,698 of funding from Breakthrough 1.

3.2 Artificial Intelligence (AI) of Things Enabling Autonomous Waste Catchments

Overview

Using AI to drive transformative change for the whole sector, this initiative will create a shared blueprint for tackling sewage pollution and flooding that is tested, proven and ready to be scaled across the UK. This project will pilot an autonomous waste catchment in Redditch which will combine emerging technologies for comprehensive testing. The project requests £1,998,000 in funding.

Project partners

Thames Water Utilities Limited, South West Water Ltd, Southern Water Services Ltd, Hafren Dyfrdwy Water, Microsoft, Rockwell, BT, Blackburn-Starling, 8Power, National Cyber Security Centre, Exeter University. **Led by Severn Trent Water Ltd**.

Analysis of entry

1. Positive impact for water customers, society, and the environment

This project has the potential to drive transformational change in the water sector and deliver improvements for customers, society and the environment. The entry clearly articulates how the successful application of 'AI of things' could contribute to tackling the identified problem of sewage pollution and flooding. But it would have benefited from acknowledging that it can only form part of the solution to resolve sewer network capacity issues.

The entry provides a detailed commentary on risks and the mitigations associated with some of these risks.

2. Innovation enablers and innovative solutions

This project offers a novel and ambitious opportunity to make a step change in approach to water sector management of assets by seeking to deploy digital approaches on the wastewater network to help deal with sewerage pollution and flooding.

The ambition of the project to share a blueprint will allow autonomous catchments to be scaled up across the sector.

3. Capacity, capability, and commitment to deliver

The entry offers a strong commitment from all partners, with senior level sponsors and a range of partner organisations with an experienced team. Excellent project management will be required to manage project costs and ensure it is delivered on budget as the entry has a limited contingency. The gated process and phasing of costs proposed in the entry should help reduce risk in this respect. In addition to the mandatory 10% financial contribution, the project partners will contribute a further 20% in-kind towards the delivery of the project.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £1,998,000 of funding from Breakthrough 1.

3.3 Catchment Systems Thinking Cooperative

Overview

The Catchment Systems Thinking Cooperative (the CaST Cooperative) aims to revolutionise the way crucial data about England and Wales' water environment is shared, in particular on the health of the nation's rivers. It aims to demonstrate the viability of a national framework for the governance and standardisation of catchment data monitoring and sharing, starting with eight catchments across the country, each from a different water company service area.

The CaST Cooperative aims to address current issues in catchment data management, which is declining, fragmented, and often outdated, due to limitations in funding and lack of widespread standardisation. It aims to demonstrate effective decision-making and build confidence in collaborative approaches, to facilitate the rollout of the framework across the country. Full implementation, which would be subsequent to the outcomes of this project, will provide a robust evidence base to prioritise investment to improve the water environment and adapt to climate change. The project requests £6,395,499 in funding.

Project partners

The Rivers Trust, Thames Water Utilities Limited, South West Water Ltd, Southern Water Services Ltd, Dŵr Cymru (Welsh Water), Anglian Water Services Ltd, Severn Trent Water Ltd, Yorkshire Water Services Ltd, Northumbrian Water Ltd, Affinity Water, South East Water, Thames Water Utilities Limited, Wessex Water Services Limited, Wye & Usk Rivers Trust, Arunand Rother Rivers Trust, Ribble Trust, River Restoration Centre, Earthwatch Institute, The Freshwater Biological Association, The Zoological Society of London, UK Centre for

Ecology and Hydrology, Cardiff University, University of Exeter, Natural Course EU Life Integrated Project, Hummingbird Technologies. **Led by United Utilities**.

Analysis of entry

1. Positive impact for water customers, society, and the environment

The entry was well aligned with the assessment criteria of the challenge and was assessed to fulfil theme five of the strategic innovation themes.

The entrant clearly articulated the problem that needed addressing, explaining how and why the proposed solution would answer this problem. This rare and ambitious project addresses a need in the water sector to develop a standardised approach for catchment data collection. It provides an opportunity to connect people with the aquatic environment, with scope to provide transformational change in the sector.

2. Innovation enablers and innovative solutions

This project goes beyond business as usual in both its aims and approaches, such as integrate citizen science which have not been applied extensively in the water sector to date. This entry could enable the joining up of disparate parts of catchment management, enabling a systems thinking approach. But the entrants must ensure that it adheres to the 'open by default' principle of the innovation fund, looking to publish as much openly as possible.

3. Capacity, capability, and commitment to deliver

The project is likely to be logistically challenging because of the size of the team and the need to incentivise citizens to get involved. The proposed team has the relevant skills and experience, although its size will have influenced the amount of budget requested, which must be carefully managed, and revisited for potential efficiency savings. The project demonstrated good commitment from senior leadership and the broad range of partners, and the programme plan provided is considered to be sufficiently detailed.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £6,395,499 of funding from Breakthrough 1.

3.4 Flexible local water supply schemes pilot

Overview

This project will tackle a new approach to the industry's water shortfall when drought occurs. By implementing flexible, multi-use schemes filtering water with lower levels of carbon and extracting water from existing, local, and natural sources, this will allow water to be used for both supplying water industry customers and alternative uses during times of normal river flow, helping to tackle the £21 billion cost of building resilience to drought in the next 30 years. The project requests £622,156 in funding[4].

Project partners

Binnies, RWE, Castle Water, University of the West of England. **Led by Bristol Water.**

Analysis of entry

1. Positive impact for water customers, society, and the environment

The entry ably describes the opportunity presented for local, flexible, multi-use schemes to tackle water resource shortfalls during droughts – a critical climate change issue. Reducing the stress on current water resources is clearly in the public interest and this entry articulates well the benefits for customers, environment and society it aims to deliver. The entry recognises that it is unlikely that all aspects of the project will work, but considers the risks, uncertainties and opportunities in a comprehensive and proportionate manner.

2. Innovation enablers and innovative solutions

The approach proposed is substantially different than business as usual thinking and has the potential to open up new opportunities in water supply, together with the creation of an associated market. This project seeks to tackle the clear barriers to localising water supply and articulates carefully how it will work through those barriers in a logical, well-planned way, including how it will adopt learnings from the energy sector, where de-centralised electricity generation has been a successful addition to large-scale power plants and other traditional methods. This approach is very innovative for water, which conventionally relies

[4] In exceptional circumstances, we were open to considering entries under £1m in value from small water companies (including NAVs) to enable water companies who would otherwise not be able to participate to take part in the Breakthrough Challenge.

on centralised freshwater sources. Plans for scaling post-pilot through a commercial 'plug and play' model are articulated well and convincing.

3. Capacity, capability, and commitment to deliver

The entry sets out clear commitment from all the partner organisations at a senior level (including CEOs) and provides evidence of a strong, experienced team with a track record of delivering complex programmes of work. There are relatively few partners on board with this project but those that are cover the key aspects of the project scope. A big miss, potentially, might be the presence of a larger water company. The implementation plan could have provided more specificity. The governance arrangements are clear and robust.

Ofwat's decision

We were satisfied that this entry could use the provision (see footnote 5 above) that enabled smaller water companies to put forward a submission under the minimum value of £1m. Feedback has been provided to entry partners that sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £622,156 of funding from Breakthrough 1.

3.5 Safe Smart Systems – Embedding resilience for the future through automation and artificial intelligence

Overview

Safe Smart Systems will use artificial intelligence to identify, predict, and manage vulnerabilities in the water system that could lead to leakages. It will do this by developing a future-oriented, secure, self-regulating AI Decision Engine which executes proactive interventions based on predicted and determined consequences of failure in a whole water system, not just individual assets (including abstraction, treatment, storage, distribution and end customer usage). The Engine will trigger automated interventions with next-generation infrastructure to prevent and reduce adverse impacts to customers and the environment. The project requests £7,524,147 in funding.

Project partners

Affinity Water Limited, Airbus Defence and Space, BIM4Water, Centre for Digital Built Britain, Imperial College of Science, Technology and Medicine, Jacobs UK Limited, Microsoft,

Portsmouth Water Limited, Skanska UK PLC, South West Water Limited, Unity Software Inc., The University of Sheffield, plus a number of supporting partners. **Led by Anglian Water**.

Analysis of entry

1. Positive impact for water customers, society, and the environment

An integrated information management system for water has significant potential and could lead to a step change in approaches to resilience and if successful would offer clear, tangible benefits for customers, environment and society. The entry articulates the problem that needed addressing and details a clear vision for how a system-based approach could work in practice to answer that problem. The project is ambitious in scope and the implementation of the proposed solution is not without significant risk (particularly concerning the AI Decision Engine), but these risks are well recognised, and mitigations explained sufficiently to provide confidence.

2. Innovation enablers and innovative solutions

This entry focuses on the first steps to achieve autonomous control in water systems across the UK. The efficient management of water from source to tap in an integrated fashion is an important and potentially transformational innovation for the sector. In terms of applying the solution across the water sector, the entry recognises that this will be challenging and that there may be some cultural barriers to overcome in achieving early adoption potentially, but the submission describes clearly plans to disseminate knowledge, share ideas both within and outside the water sector and implement new business practices to prove concept and secure sector commitment. Experience and expertise of partners add credibility and confidence to the plans.

3. Capacity, capability, and commitment to deliver

The entry evidenced a good commitment from senior leadership and from partners, including financial contributions which exceed the minimum requirement. The project team is strong, experienced, diverse and capable, offering a good blend of academic research and knowledge, operational experience, suppliers and industry experts relating to leading edge technology. The entry has put together a well-considered delivery plan, with stage gates at appropriate junctures. The entry demonstrates a proportionate and effective approach to managing risks.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £7,524,147 of funding from Breakthrough 1.

3.6 Transforming Customers' Lives: Integrated Pathways to Fair and Sustainable Water (FAIR WATER)

Overview

The Fair Water project seeks to address the need for changes to water services and use in the home. The project aims to uncover the optimum 'pathways' to water sustainability for customers and their homes by developing, testing and demonstrating more sustainable water solutions that can be applied in existing homes, and that will be acceptable to customers. For example, it will focus on encouraging behaviour changes and developing new product innovations for tasks such as laundry and dishwashing. The project requests £3,784,939 in funding.

Project partners

Northern Gas Networks Limited, University of Newcastle upon Tyne, The Procter & Gamble Company and Affiliates, National Energy Action. **Led by Northumbrian Water.**

Analysis of entry

1. Positive impact for water customers, society, and the environment

The entry clearly articulated the problem that needed addressing and explained how and why the proposed solution could provide an answer to this problem. The project seeks to develop and demonstrate more sustainable water solutions that can be applied in existing homes, and that will be acceptable to customers. A combination of behavioural change approaches and product/service innovations will be used. It therefore has the potential to have a positive impact for water customers, society and the environment.

The entry presents both project delivery risks and wider thematic risks with proposed mitigation measures. It also sets out potential benefits even if it does not achieve its intended outcomes. The entry presents an opportunity to convene a collaborative, cross-sector

partnership looking at systemic issues around water - energy nexus, product affordability and demand management. The entry recognises the challenge for the industry to achieve the transition and positions the entry as a collaborative evidence-based approach that would deliver significant advantages in the long term over ad-hoc initiatives.

2. Innovation enablers and innovative solutions

This entry offers a multi-discipline, multi sector co-creation approach which aims to demonstrate a combination of technology and behaviour change to move the dial on sustainability. The entry set out a good description of innovation enablers and the leveraging of existing innovation infrastructure.

The entry provided realistic plans for demonstrating the practical outcomes of the project, but scalability at a national level needs to be considered carefully by the project team.

3. Capacity, capability, and commitment to deliver

There is evidence of a commitment to the entry at senior levels and from partners (including additional funding provided). The assembled team bring relevant skills and experience from different water segments, but the project plan could have been clearer on how these skills are to be leveraged. There will also be an advisory group which will provide challenge and direction to enhance the potential of this project. And the entry sets out key tasks and realistic milestone phases (with the inclusion of KPIs), and good detail has been provided on cost management. We also consider that risk management for this entry is well thought through although it could have benefited from greater clarity around organisational risk.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £3,784,939 of funding from Breakthrough 1.

3.7 Transforming the energy balance of wastewater treatment

Overview

The aim of the project is to transform wastewater treatment by eliminating the energy consumption associated with conventional processes, estimated at between 30-40% of the

water industry's energy consumption. This entry will test two cold anaerobic wastewater treatment processes which has the potential to reduce carbon dioxide and nitrous oxide emissions and yielding phosphorus and nitrogen in forms that can be readily recovered. The project requests £6,260,000 in funding.

Project partners

Dŵr Cymru (Welsh Water), University of South Wales, South West Water Ltd, United Utilities, Yorkshire Water Services Ltd, Northumbrian Water Ltd, Scottish Water. **Led by Thames Water Utilities Limited.**

Analysis of entry

1. Positive impact for water customers, society, and the environment

This entry clearly articulated a critical problem for the water industry with the potential to contribute to the UK's net zero[5] commitment, improve the ecological status of our waters and lower costs, which should help towards customers' bills. The project builds on existing research and practice and then takes this much further to substantially extend current thinking and accelerate progress.

Although there are good plans for scale-up, roll-out and dissemination (including a dedicated work package for this purpose), the project will need to consider the impact of the size / scale of the facility and how this may impact plans for scaling in the future. The entry is realistic about the potential for failure and mitigates this strongly through robust governance and risk management.

2. Innovation enablers and innovative solutions

The use of anaerobic process technology will be applied in a novel way to deal with complexities of use in cold climates and the approach taken to develop process configurations that combine proven technologies with those still at development stage. Consideration has been given to partnership arrangements to disseminate findings and outcomes effectively and plans for adoption at scale are strong.

3. Capacity, capability, and commitment to deliver

The entry has evidence of commitment at senior levels, through financial contributions, through partner involvement in different trials and in-kind through the Technical Working

[5] net zero refers to the balance between the amount of greenhouse gas produced and the amount removed from the atmosphere. We reach net zero when the amount we add is no more than the amount taken away.

Group. The team proposed is strong and includes members with relevant skills and experience, with clearly defined roles and responsibilities. The programme of work is set out clearly and the timetable appears to be well considered and achievable. The level of uncertainty in this project is high and acknowledged, but the governance is strong, and the stage gate approach (alongside the risk management plan) should ensure risks are mitigated appropriately throughout.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £6,260,000 of funding from Breakthrough 1.

3.8 Triple Carbon Reduction

Overview

By tackling the persistent problem of Nitrous Oxide emissions produced during secondary wastewater treatments, the Triple Carbon Reduction project seeks to i) eliminate greenhouse gas emissions from secondary wastewater treatment, ii) deliver a step change reduction in energy use for secondary wastewater treatment, and iii) provide a renewable energy source through hydrogen production. The project requests £3,781,541 in funding.

Project partners

Jacobs UK Limited, Oxymem Limited, Element Energy Limited, Northern Ireland Water Limited, Severn Trent Water Limited, United Utilities Plc, Scottish Water Limited, @One Alliance, University of East Anglia – School of Environmental Sciences, University of East Anglia – UK Energy Research Centre (UKERC), Brunel University, Cranfield University. **Led by Anglian Water Services Ltd**.

Analysis of entry

1. Positive impact for water customers, society, and the environment

The entry clearly articulated the problem that needed addressing and explained in detail how and why the proposed solution would be the answer to the problem. The project is proposing

to combine three technologies to reduce greenhouse gas emissions and enable clean energy production. The entry offered a very plausible explanation of why the proposed solution would answer the problem, including how it will help to address an important issue and could help water companies to reach net zero. As such positive impacts could be seen for water customers, society and the environment.

The entry sets out a realistic reflection of risks and opportunities and presents plans to ensure that the maximum learnings are still achieved if risk materialise.

2. Innovation enablers and innovative solutions

The project could enable a step-change in the water sector's approach to net zero. There is a good description of innovation enablers and the submission provides clear steps for scaling up activities within the water sector, including by focusing on sharing information within the wider industry.

3. Capacity, capability, and commitment to deliver

The entry evidenced a good commitment from senior leadership and from partners. Details of a strong and capable team with skills and expertise have been provided. The complexity of the project and its multi-discipline nature means that strong project management will be required. The entry provided a realistic programme with a gated process and includes an assessment of risks and control measures, but project leads must ensure risks are tracked through delivery.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £3,781,541 of funding from Breakthrough 1.

3.9 Water Neutrality at NAV Sites

Overview

Water Neutrality at NAV Sites aims to deliver a water neutral housing development. It will minimise water demand and offset water consumption using new technologies, to ensure the total water use in the community remains the same as it was before the new homes were built. The project requests £2,898,000 in funding.

Project partners

Albion Water Limited, BUUK Infrastructure UK No 2 Ltd, Propelair - Phoenix Product Development Limited, H2OiQ Limited, SDS Ltd, Hydraloop International, Skewb Ltd, Aquality Trading & Consulting Ltd, Grapeviners Ltd. **Led by Affinity Water.**

Analysis of entry

1. Positive impact for water customers, society, and the environment

The entry clearly articulated the problem that needed addressing and explained in detail how and why the proposed solution would be the answer to the problem, including the drivers for change, e.g. net zero. The entry articulates why a stand-alone approach wouldn't work and proposed a collaborative approach across a full range of stakeholders for the development sites. The entry identifies key risks and has considered the mitigation of these in a risk schedule. The entry clearly articulates the benefits that would be derived even if the project does not attain its objectives and has proposed project control measures to stop the project if a risk is realised, thereby ensuring there is no wasted expenditure. However, further consideration should be given to the risk that customers and/or developers become disengaged in the project and how they would mitigate these.

2. Innovation enablers and innovative solutions

The project offers a good vision for the future of water in the home and has the potential to be very impactful. The entry demonstrated that the solution was innovative, going beyond business as usual, and it is considered that this project would be unlikely to progress without this type of funding. In isolation, the individual technologies and approaches are not transformational; the innovative aspect comes from the insights gained from use of these individual technology and approaches in combination, including by reference to the multi-stakeholder representation. A dataset of this kind, at this scale has not previously been developed. The commitment stated for knowledge and data sharing is excellent, but further consideration should be given to how it will be scaled across the sector. The project should also ensure that its successes and failures are carefully recorded as there is the potential for significant and shareable learning either way.

3. Capacity, capability, and commitment to deliver

Support at senior level has been demonstrated in the entry, and evidence of a commitment to the project is clear from the strong partnerships and collaboration, including by reference to financial and resourcing commitments. There is a good team structure consisting of a team with relevant skills and experience. The governance to be provided by the steering group, and its proposed composition, is a positive. However, this could be even stronger if a community

representative is included for future stages. The project plan is well structured, and we note that the programme has been developed in consultation with key stakeholders. The project duration appears ambitious, particularly because of reliance on the engagement of sites and the pace at which these will be developed.

Ofwat's decision

Feedback will be provided to entry leads which sets out specific areas of improvement which the project should consider in taking it forward.

This entry will receive £2,898,000 of funding from Breakthrough 1.

4. Projects not selected for funding

31 eligible entries (totalling approximately £117m in value) were competing for a share of the £40m funding available. Feedback has been provided to each entry lead of unsuccessful submissions with suggested areas of improvement should they wish to re-submit their project to future competition rounds. We saw five projects at Breakthrough 1 which had particularly high potential to deliver transformative innovation for the sector in key policy areas we have a focus on currently, but we considered that these entries require further development to confirm this. We did not fund these projects at Breakthrough 1 but have informed entry leads within the feedback letters that they may choose to re-submit their entry directly into stage 2 of Breakthrough 2. Entries entered directly into stage 2 will be assessed in the same way as other entries – against fixed criteria and in the round.

Of the 31 eligible applications received, 22 did not receive funding at Breakthrough 1. There were a number of more general areas of feedback identified during the Breakthrough 1 process that we wanted to share with all entrants to support entries (including those previously submitted) into future rounds. Entries could have been stronger if they:

- 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;
- more clearly articulated how the project would offer good value for money in terms of delivering more impact for the amount requested;
- provided more detail on project plans to scale up and roll out across the sector;
- better articulated the business case to provide more reassurances about the viability of the programme, including cost contingencies;
- provided 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 clearer project management plans with stage gates linked to objectives / outcomes of the project particularly for higher risk / lower technology readiness projects;
- provided a more detailed approach to risk management, particularly given the amount of funding requested and the lower technology readiness level;
- more explicitly articulated what the proposal was aiming to achieve, detailing its objectives and intended outcomes. Entries should have considered why the solution offered was the best answer to the questions posed; and
- showed clear contingency plans to deliver benefits 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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