

October 2024 – Project Monitoring Updates

This document contains the updates provided by each project from the October monitoring cycle. Innovation Fund projects have now moved to a bi-annual monitoring cycle, so any projects not featured here might not have been required to submit a monitoring form this cycle, or might not be included for the following reasons:

- reached completion of their project
- not yet started the project
- not provided an update this quarter.

Contents

Innovation in Water Challenge (2021)2

Breakthrough 1 (2021)2

 Alternative Approaches to Phosphorus Removal2

 FAIR Water2

 Safe Smart Systems3

 Triple Carbon Reduction3

 Project Zero3

Breakthrough 2 (Catalyst) (2021/2022)3

 Defusing the Nitrate Timebomb3

Breakthrough 2 (Transform) (2021/2022)4

 CHP Exhaust Carbon Capture and Utilisation (CECCU)4

 Managing Background Leakage4

 National Leakage Research and Test Centre4

Breakthrough 3 (Catalyst) (2022/2023)4

 Artificial Intelligence for Algal Monitoring4

 Using Science and Nature to end Sewer Misery5

 Water efficiency in faith and diverse communities5

Breakthrough 3 (Transform) (2022/2023)5

 Net Zero Hub5

Stream 2.....	6
Breakthrough 4 (2023/2024).....	6

Innovation in Water Challenge (2021)

No project updates this quarter.

Breakthrough 1 (2021)

Alternative Approaches to Phosphorus Removal

Our Alt-P programme is rapidly coming to an end. All site works have been completed and we are now focusing on writing up our findings. Over the next two months reports on all three work packages will be available along with our Ofwat final report. These will be made available via the Spring platform for all water companies to absorb and hopefully adopt. The Alt-P programme has seen a significant amount of interest in recent weeks which has included the gathering of 62 like minded individuals, from 19 different organization, at our Alt-P day on 17th September at the United utilities head Office. Video of the event will be made available via the Spring platform.

FAIR Water

The project is making good progress on several elements. 1. By July '24 fifteen households were installed with point-of-use water sensors on 56 appliances, collecting 3+ months of household water use data. The data from these months provides a baseline for each household, with which the effect of planned interventions from October '24 onwards can be compared. Additional sensors will be installed in October and November to reach a total of 50+ households. 2. The project plans to obtain overall household water use data from smart water meters in the same 50+ households. However, this requires a new mobile phone-based communications system, as the dedicated smart water meter system is not yet installed in the region. This new system has been successfully developed by a sub-contractor, with installations scheduled in Oct-Nov '24. 3. The water-use data collection and analysis systems have been successfully implemented, with digital processing and visualization tools/dashboards now available in the consortium. 4. Selected households were sent a survey on water use perceptions. The responses have been received and are currently being analysed for insights on consumer perceptions and understandings.

Safe Smart Systems

Our solution concept continues to be iteratively developed based on ongoing user testing and feedback. Within our innovation area, we expect our first operational users to be provided with enhanced insight on system performance, notified when there are anomalies on the network and be advised on recommended response options to resolve detected issues quicker and more effectively. Users will also have the capability to implement certain response options remotely.

Triple Carbon Reduction

The Triple Carbon Reduction demonstration plant has just arrived at site. Installation and commissioning activities are now underway to allow the Integrated IES plant operation. MABR has been operational since September and different operational conditions are being explored to stabilise the process and prepare it for integration with the electrolyser.

Project Zero

In the last quarter we commenced our smart meter rollout with 507 meters installed, alongside utilisation of B4T's innovative jellyfish solution, enabling network connectivity as part of a smart network. We worked with IWNL to understand data integration and foundations for a consumer app and collaborated with our internal teams to use smart network data to produce a monitoring dashboard for sites with water neutrality requirements. We have finalised install dates with retailers and their customers to complete our offsetting work stream, with an evaluation report to be produced following. We are engaged in legal discussions with Southern Water on undertaking a trial for the water savings market, due to regulatory requirements in North Sussex area. We have defined strategy for site 1, Chigwell (Oaklands). Due to regulatory barriers, we will undertake a desktop study in collaboration with Albion Water. We will explore data available from the dual networked and metered sites. We are working with Urban&Civic to formalise Site 3 requirements and benefits of a water reuse systems. We have completed our economic modelling assessment for site 2 which sees fantastic offsetting results, as well as our open data paper which sets out our open data strategy.

Breakthrough 2 (Catalyst) (2021/2022)

Defusing the Nitrate Timebomb

Since July 2024 we have overcome modelling issues (Task 2) and then encountered a few more which we are working hard to resolve. We may have to cut down the size of the modelled area to ensure we can produce calibrated outputs on which to test scenarios. In July we ran a short online

workshop to get feedback on the types of scenarios (Task 3) we would run in the final model and to help us design how the outputs will be visualized. We are looking forward to completing the model build, running scenarios and planning the final presentations in a stakeholder workshop in December (Task 4).

Breakthrough 2 (Transform) (2021/2022)

CHP Exhaust Carbon Capture and Utilisation (CECCU)

The design of the Carbon Capture Machine is substantially complete including CHP interfaces. Most long lead time items are delivered and in storage awaiting construction. The location of the project has recently been moved to Strongford Sewage Treatment Works, where it will be integrated into the works for the Net Zero Hub and where there is an existing Severn Trent Water framework contractor already in place to carry out the works.

Managing Background Leakage

Field survey work in the 10 Phase B DMAs is now complete. Consumption and customer side leakage data has been analysed. Modeling to localize any probable network leaks is well advanced, and a meeting is planned for 30th October to agree follow up survey work. Field survey work has commenced in the first of the 15 Phase C DMAs. Work has also commenced on the Phase D uncertainty analysis.

National Leakage Research and Test Centre

The project has now substantially completed the detailed design work required for the NLRTC. The project has completed a pre-application meeting with the local authority who received the proposals positively with limited comments. This gives the project team the confidence that when a planning application for the centre is submitted it will be approved.

Breakthrough 3 (Catalyst) (2022/2023)

Artificial Intelligence for Algal Monitoring

Over the past quarter, I have been testing different model components with an open source algal dataset containing 6 named classes/cell types. This includes testing each model with and without pretrained weights, the amount of epochs used for training (50, 100, and 200 were compared) and four different optimizers (used to accelerate model training). The results of optimizer testing varied greatly depending on the individual model being tested, as well as varying depending on weights (e.g. with or without pretrained weights). With these tests some models showed classification

accuracies of 95%. For the next quarter, I will be testing another open source dataset with 88 classes to compare previous test results as well as testing project produced data. Then data augmentation techniques will be tested and the accuracy will then be compared to results where these techniques were not applied. (Holly Liken, Bristol University)

Using Science and Nature to end Sewer Misery

Root Defender has made good progress over the past 3 months. Team have been working to get the correct properties for the spray in place solutions, and there have been shared lessons between the 'spray in place' and 'gel' solution optimization team. The project solution is undergoing testing at Durham University with optimized solutions being tested via an outdoor test rig in the next phase.

Water efficiency in faith and diverse communities

We currently have two behaviour change campaigns live - the first is our "Reviving the Sunnah" campaign which focuses on the act of 'wudu', within the Islamic faith and the second campaign is our rice washing campaign focusing but not limited to the UK's South Asian community. For our "Reviving the Sunnah" campaign we have so far had over 120 pledges to save water through wudu and have requested free water saving devices including our exclusive wudu ablution bottle (a first time for any UK water company) and/or requested a home water audit undertaken by Groundwork. Our rice washing campaign went live in August where we worked with Malaysian MasterChef winner, Ping Coombes, plus Garden Organic's expert and author of South Asian Beauty, Sonia Haria, to create content appealing to gardeners, cooks and beauty enthusiasts. We created a series of videos showing water-efficient rice washing and ways to reuse the starchy water, such as watering plants and in hair/skin spritz. So far, the rice washing videos has had 86,014 ThruPlays (views) in two weeks live (one week per video) and received a lot of positive feedback in comments on social media. We also plan to release 30 second TV ads this Autumn via Sky AdSmart and engaged with local Gurdwara in Smethwick to capture their feedback. The next few months (as we go towards project final reporting end of January) we will be starting to evaluate and collate all learnings (both qual and quant) as we have already started to undertake a number of independent led focus groups (led by Explain) with different communities currently covering the Muslim, Hindu and Sikh communities to gain further insight into attitudes to water and barriers and opportunities to save water.

Breakthrough 3 (Transform) (2022/2023)

Net Zero Hub

Actilayer: Construction has continued at pace throughout the last quarter, with steel structures now erected on ASP6, and lifting complete; work will commence on retrofitting Actilayer to the Liquor Treatment Plant and making the existing structure airtight. Commissioning activities are in

progress across all ASP lanes, as per the planned sequence. The impact of the Actilayer will be measured through the emissions monitoring plan, and substantial work has been undertaken in since the last submittal on validating the sampling method for performance appraisal. UV efficacy testing will continue through this quarter. Training and handover discussions for operational teams is underway, as well as the development of the design manual for the retrofitting of these technologies. Digital Twin: Good progress is made on the wireframe design, modelling building, and data architecture. Simulation and optimisation strategy is under review and will be confirmed this quarter.

Stream 2

We're now live on our enduring open data platform (www.streamwaterdata.co.uk) and focusing on our next group of use cases and datasets to be released shortly. We're also working on building up our community of users and, now that we have a stable platform in place, we're reaching out to many other projects and organisations who could benefit from Stream. We're also working closely with our regulators, Ofgwat, the EA and Defra to ensure we join up our efforts in the open data space, work together where possible and learn from each other.

Breakthrough 4 (2023/2024)

Breakthrough 4 projects are currently in the process of being set up. Quarterly updates will be available once projects have started.