Water Breakthrough Challenge Winners Showcase Event

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**Harry Armstrong** 00:05

Today, this is really exciting for us, as the the end of the first round. This has felt like quite a long journey from our point of view. I think we've been developing this for a while. We've been working with the sector for quite a while to get to this point.

**Harry Armstrong** 00:23

But it's fantastic that we're finally here. And we're really pleased with the progress and the bids and the work that the sector has done to get to here. To get to this position to date. And so it's fantastic to actually be able to introduce our first winners of our first Breakthrough Challenge so the big, big funding pot.

**Harry Armstrong** 00:42

And to be able to see, I think, the breadth of kind of innovative projects, the breadth of focus, the types of projects that we've got through. A lot of these pick up on really important areas, some of those innovation themes that we've outlined, but you know, bigger issues around climate change and other critical issues the sector faces. So it's great to see the breadth there. And we're really hoping that this is the start of something that we're going to see continue, you know, interest, broad areas of projects. But also just the amount of effort that companies put in has been fantastic and we really hope to see this level of engagement continue into the second round, which will open very shortly in a week or so. So this hopefully will be harbinger of great things to come. And we're just at the beginning of this journey. And there's a lot more money to spend, a few more years in which we're definitely going to be running the Fund and opportunities potentially beyond that.

**Harry Armstrong** 01:42

So we hope that you, those who are coming in to see this and also those who've been putting in bids see this as part of that longer journey. And as part of that, we're really pleased to see the kind of culture change, the interest grow in the sector and changing attitudes around things like collaboration has really been fantastic to see. That is one of the key things that we want this Fund to do is to enable, catalyse some of these activities and some of these ways of working. And hopefully both will continue. And we've also seen projects, not just through this round, but through the past round that we hope will also try to ingrain and enable some of these these activities to continue into the future. So I don't really have much more to say than that.

**Harry Armstrong** 02:33

I think, you know, the projects that we're going to see today, are a really fantastic bunch. And these provide, I think, a really interesting window into where the sector is at the moment. There's also lots of other areas that we think more could be happening within and we we want to work with the sector in future competitions to try and drive change in other areas too. So we're excited to do that. I'm excited to keep working with you guys through this and through future rounds. So I'll stop there, and hand back over to Catherine and then over to our judges, who can talk a bit more about what they've seen,

**Harry Armstrong** 03:09

where they think some of the interesting stuff is and where there are opportunities for the future. So thanks very much.

**Catherine Thompson** 03:19

Thanks very much, Harry. And I'll pass over to Arlene who's going to be chairing a brief discussion from our fantastic judges. So we've got today joining us Niki and Paul. Over to you, Arlene.

**Arlene Goode** 03:31

Thanks very much. Thanks, Harry. I'm absolutely delighted to be here today. I'm Arlene Goode and I'm part of the delivery team. I work for Arup as advisory. And today, you know, I'm joined by two of our judges from the process. I mean, we had a, we had a you know, none of this would have been possible without the amazing judging panel that we had. And that was comprised and really, you know, a real powerhouse of experience. So two of our judges have joined us today. And if I can just introduce Nicky Roach, who's the Director and co-founder of Axia Origin and the immediate past president of CIWEM. Hi Niki.

**Niki Roach** 04:25

Morning Arlene. Morning everybody, lovely to be here.

**Arlene Goode** 04:28

And Paul Connell, who is the founder of Open Innovations, which was formerly ODI, in Leeds. Hi, Paul.

**Arlene Goode** 04:36

Of course, there were eight judges in total and across everyone there was a real breadth of experience and perspectives, wasn't it? So I just wanted to open up a question for you both really. What really stood out? I mean, we went from 31 initial entries to selecting nine really fantastic winning projects. So I mean for you, what stood out about those winning entries? And I'd be interested to get your thoughts on that. Paul, shall I start with you?

**Paul Connell** 04:36

Morning everyone.

**Paul Connell** 05:14

I was waiting for who's go first. I think the thing I took from it was the depth and consideration that people have made and how they could innovate with the, within the water industry. The focus on amplifying new technology, but then also the focus on data. And I was really surprised by how much there was a focus on data technology in these as well as the innovations within the processes of the water industry.

**Arlene Goode** 05:54

Thanks, Paul. And what about you, Niki? What's your reflections there?

**Niki Roach** 05:57

Yeah, I mean, I'd obviously agree with Paul. I guess, coming at it from a slightly different perspective, maybe. For me, I was really pleased to see how much collaboration was going on, both, obviously, across the water sector, but also kind of beyond that. So it's really good to see academic partners playing a key role. I think that's a huge opportunity for us as a sector through academia, actually, to bring more diverse voices, and to bring really kind of evidence-led understanding into what we're doing. So like the AI entry, for example, University of Exeter, National Cybersecurity Centre, Microsoft, and it's just one example. So for me, it was lovely to see that the sector had really kind of lifted, lifted their eyes up and gone beyond the perhaps that the more anticipated and more kind of more familiar voices, I think, really.

**Arlene Goode** 06:42

For those winning entries, so we've awarded £36 million in these nine projects. What advice would you give for those winning entries, Niki?

**Niki Roach** 06:54

Maybe controversially, but I would say be prepared to take some risks and to fail. I think, you know, it's customer money. And I'm not advocating that we're reckless. But we've got some ginormous challenges, haven't we, and we need to address those. And I think, you know, my understanding of innovation is about failing fast, and learning and going again. And so I think whilst, you know, the entries that we put through had really solid risk logs, they'd really thought about what the potential pitfalls were. And that's brilliant. And that gave us confidence, I think, didn't it, Paul, as a judging panel that they have thought that through. But I think there must be an expectation of innovation that sometimes things aren't going work. That's the point of innovating. So yeah, my advice would be, take some risks and be prepared to fail and fail fast.

**Paul Connell** 07:40

So I'd like to amplify that and say that the ones we put through everyone was really solid, I think there was a couple of things that the judges would've liked to have seen more of. And that's more more risks, increased pace. Every single one of these or even the winnings ones had a very linear approach to how they were going to do a project. They were going to do an initial discovery phase, and it was a very linear approach to how they were going to do work on the projects. We would probably liked to have seen more pace. So more experiments upfront, fail, publish it all widely, so everyone can benefit and move quicker. And I think the one if the ones that went through had that. But if you had that in your bid, you would definitely have made a difference. And you would have had a point of difference against the other applications. So be prepared to fail, do lots of experiments, do it at pace, and try and do it in the open so the rest of the water industry can benefit. And then the last part of this is, I'm not I don't work in the water sector. A lot of the initial discovery phases of risks have already been managed by other people working in other sectors. So for example, banking, transportation, construction. A lot of the risks have already been managed, and people are already doing that. So I would look, I would, I guess, suggest to people that they maybe look outside of the sector and outside of your current supply chains, and maybe look to some smaller businesses and organisations that are working in innovation, data and the web.

**Arlene Goode** 09:21

That's a really good point, Paul. And the point that you made there around being prepared to fail. And taking risk is, you know, that risk part is, is something that we're quite keen to encourage greater risk taking but I think it's failing in a controlled way that we want to do so that you know, it's not that we're looking entirely for projects that are guaranteed to succeed but to really be in a position where you control.

**Paul Connell** 09:49

And I was really surprised at the size of these bids. They are massive. They are multimillion pound projects and with multimillion pound projects come Governance Management, organisational dark matter that slows things down. I think there's something to have about setting yourself up at the start to be innovative and learn and sharing. And I'll say this again, move at pace, which builds into a large project. But that would be my position is, try and create those conditions for innovation at the start of the project. And you can't always predict what's going to be out at the end of it, you know, and that's, that's difficult to manage on a multimillion pound project. So maybe some smaller projects that come in that could lead into bigger ones, may be a way to go.

**Arlene Goode** 10:45

Niki, have you got any reflections on that? I know that your experience in this area might be useful here in terms of, you know, large projects being delivered.

**Niki Roach** 10:58

Well, I mean, I think. Well, I think I would agree, I would agree hugely with what Paul said. And I think, for me the benefit of the next round, is that actually, you're not having to pick a pot or you are, but it's, you know, there's a bit more fluidity, I suppose maybe. I think it is hard for, for companies, it's either, you know, a small project, or then £1 million plus. And actually, those are quite different things. And so I think this is a learning journey for everybody, isn't it? The water companies, the regulators, the partners that are coming on board, judges for this round. But I think Paul's right about, how do we, even when things get ginormous, it doesn't mean you can't be innovative. I think it's thinking about how to bring that innovation in and what mechanisms can we use. And, you know, water companies have got some fantastic examples out there of approaches to innovation. I don't mean just the specific deliverables. But you know, you look at the Northumbrian Water Innovation Festival that's happening in a couple of weeks time. And I think that looks absolutely amazing. I have no vested interest in that. But I just think what a brilliant coming together, and the approach is really innovative as well. And I think really setting ourselves up, as Paul said, early doors to stay open and not get ourselves perhaps into the mindset that we might more classically do of, if this is like another large capital scheme, you know, right, we've got six million quid, what do we need to do? And then kind of head down again, and actually, just it feeling a bit different, I think is really important and it's difficult, but I think we have to keep challenging ourselves to do that.

**Arlene Goode** 12:34

Great, thanks very much. So as I mentioned before, we had 31 entrants, nine winners. And of course, there were many who were unsuccessful. Although, in saying that, there were within those some fantastic projects. So what would you, what advice would you offer for any entries that were not successful in this round? Niki, I'll start with you since you're still on the screen.

**Niki Roach** 13:06

So I entered with, prior to being a judge, the first round of this competition and was unsuccessful. And so I guess I have a, I've seen it from both sides. And I have a sense of how much effort goes into putting a bid together. And just getting to that point. And I think it's, I wanted to say at this point, the judges really got a sense of that, and the technical assessors prior to the judges panel. And that was really recognised because I know this is a really big change for the sector, there is a huge amount of effort that goes into putting these bids at this point. And I feel really, really strongly, as Arlene will know actually, because we've talked about it since the event, that that effort isn't wasted. And so for me, the most important piece of advice is, don't let the fact that you weren't successful getting funding through this competition, in this round, be a reason to stop. There were reasons projects didn't get funding, and hopefully reading the feedback, we tried to give quite careful, detailed feedback to explain why things weren't successful. But actually looking for opportunities to maybe that's collaborating, maybe that's looking for alternative sources of funding. I would be really keen for all of the projects, whether they were successful in this round or not to be very visible, because you know, we had this really privileged, helicopter view of what the whole sector was thinking. And I like connecting things. And I was immediately thinking, oh my goodness, there's all these other things that we could do. I would really encourage everybody who entered to find a way to talk about what you were thinking about. And you might find either other funding routes open up or other collaborators come on board, or you can strengthen that entry for the next round. So that would probably be my overarching kind of piece of advice.

**Arlene Goode** 14:51

That's great Niki, and I think you're right there. There was some synergies and complimentary projects where you could just see, you know, in isolation, that's a good Project but actually, if you, you know, if you connect the dots and you can do this all together, then that just makes it even more. Paul, any any advice from you on entries?

**Paul Connell** 15:11

I'm going to add to what Nikki just said in terms of, the more you, the more you connect your data, the more valuable it is, the more you share, the more likely you are to make, make new friends. So people who have submitted, I would, you know, write a blog post up as soon as you can, describe the project you were doing, talk about the challenges you've got, try and be on the web so that you can find more friends as soon as possible. And also that none of the projects seem to consider the water industry as a solo planet on its own, orbiting a sun when it's not really, you're part of an ecosystem. So the challenges for utilities are pretty similar across the piece, especially when you talk about data and infrastructure, and also sharing data for public good. The piece around our customers, your customers are the same for the health service, for local government, for national government, for other utilities. So if you want to help customers in a certain aspect, partnering with other people who've already looked at these problems in the past, and that have very well documented solutions that could be amplified and developed again, would be something I'd suggest. And the way you find out about that is telling people you're looking at it and let them find you rather than do an engagement. So be more open and share more effectively. And also try and get to the answer a bit quicker. And if you're going to build a piece of data infrastructure that worked for the water industry, that piece of data infrastructure could work for other utilities, for the health industry as well. And it may be a way of creating significant civic and social capital, that could be beneficial. And we sort of saw that in the bids. But I think that's something that could be really brought out of how this project could create social and civic capital for our places. And you are, water industries are anchor institutions in the places they are. So I think that's something that we as the judges would like to have seen come out.

**Arlene Goode** 17:26

That's a good point.

**Paul Connell** 17:29

Because you are spending millions, these are very large projects in the context of innovation, and they could have a massive impact.

**Arlene Goode** 17:40

Yes, Niki, I don't know if you've got any thoughts on that as well.

**Niki Roach** 17:45

I mean, I think I would, you know, Paul and I have not prepped in advance, but I would really echo what he said. I think, more diverse voices, it's something I think most of us probably feel quite passionate about, we recognize that the sector is changing, the needs of what the sector sort of delivering around population growth, climate change are changing. So it was great to see diversity of thought and organisations. But I would love to see more of that. That would have been brilliant. I think I would also say, actually, in terms of what else would have been great to see, is more non-technological innovations. So I think we've got some real challenges around the culture in the sector, and around the way we procure, around our supply chains, around, you know, really embedding circular economy principles, for example. It would have been great to have seen a breadth of entries that weren't just and they weren't all just, of course, but more stuff that wasn't just technology, I think would have been great. And perhaps controversially, you know, maybe Ofwat aren't listening, maybe they are. But opportunities to really innovate against our current regulatory framework would have been really interesting. So I think, for those of us that have worked in the sector for a while, you know, that kind of, we can often see regulation as the reason we can't do the things that we want to do. And I think and that's not a criticism of the regulator, I think it's just sometimes it's an easy, it's an easy place to, to throw a bit of blame. And actually, for me, seeing innovations that really push against that and maybe that's longer term thinking that takes us out of the AMP cycle. Maybe that's really exploring what it would really take, you know, top down, to generate more kind of resilient, sustainable outcomes for customers. And if that means that the current regulatory framework, be that environmental regulation, economic regulation, doesn't fit, well, it would be interesting to innovate and maybe to take some of the regulators on that journey as well. So yeah, if the feed suddenly goes, you know, I've said something really controversial. I just think that would be, I think that would be really interesting and it would have been lovely to have seen.

**Arlene Goode** 19:56

Ok, right. That's great. I mean, it's just interesting when you're looking across all of the entries, is there a kind of chime or, you know, sometimes there's a hook that gets you and that you go, "oh, this is good." This is a really good, or something that was maybe missing that you just thought isn't if you could choose one thing where you just think, yeah, that's it. Was there anything in particular that you could, that you were looking for?

**Niki Roach** 20:30

Are you coming to me or Paul?

**Arlene Goode** 20:31

Yes, sorry, yes. Anyone who can think of one.

**Niki Roach** 20:35

Do you want to Paul?

**Paul Connell** 20:36

I'm just going to say, pace, be quicker. All these projects started really slowly, you're going to have an assessment that you use, it's very linear. I think we have, when we talk about climate change, we don't have time, when we talk about diversity, social inclusion, we don't have time. I would like to have seen more pace injected into the projects and their proposals. And that way, we can maybe experiment right at the start, we work out what works, we amplify that, and we move forward. We don't have to spend a quiet period working out what it is we're going to do, let's do that, and maybe do that in the open. And the other part of this is that there was a significant amount of partnerships with very large organisations that are currently in your supply chains. So it felt like there weren't many other different voices from outside of the water industry involved in the projects. And I'd like to have seen that as well. So they're the things that chimed for me. Well, I'm always looking to see how we can improve. So that's where pace, be more open, and maybe looking for different voices involved in the project.

**Arlene Goode** 21:53

I mean, we may see that evolve with time, Paul. I think really the, you know, we've, I think as we move through the Fund, and then subsequent competitions, we may just actually see that starting to happen. I'd hope so. I'm hopeful and I think it will. Niki, how about you?

**Niki Roach** 22:12

Yeah, I'd really agree. I really would. I think exactly what Paul said. And for me, diversity of voice, it's harder when it's bigger sums of money, isn't it? But I think it's really important and being innovative about how we bring those voices in as well. And how, Paul's point about being open in order to do that, I think is one route. So yeah, whenever I saw some new names, I think, I took a little bit more of a second look to think, that's interesting. So why have they done that and what are those guys bringing? And particularly also when those names are bringing funding as well, you know, being being blunt, if you're working with partners who are prepared, who are so committed to whatever it is that you're doing that they want to put money in as well, well, that's really interesting. And that shows, you know, if you've got some skin in the game, that you are really bothered about it. So I think, finding interesting partners, and also finding partners that are prepared to fund as well, I think is really powerful.

**Arlene Goode** 23:07

Thank you. And, Niki, I'm just going to pick on you for this one. So what do you think that the Innovation Fund really means for the water sector?

**Niki Roach** 23:22

Yeah, I mean, thanks Arlene. It's, I think, you know, it's a real opportunity to bring real focus, I think, on the sector. It's one that I think increasingly, the public are aware of, but we often feel a little bit hidden, I think. And so something like this puts focus and with that comes scrutiny, but also comes opportunity. I think it gives us an opportunity to really put collaboration and, you know, Paul talked about anchor organisations, I think those of us that work in and around the sector know how important it is, and how connected it is to lots of other sectors. But it's also complex, you know, a regulated monopoly with competition, but everybody's ultimately trying to do the same thing, is complicated. But I think there's an opportunity, that brings its own opportunities, and the uniqueness of that brings its own opportunities. I think there's lots been happening for years, you know, UKWIR, HR Wallingford, you know, WRC, CIWEM, internal water companies are doing great stuff. Spring I think gives the sector an opportunity to bring things together. I think there's a watch out though as well. So I think whilst those are all the goods, I don't think we want the sector to just become good at bid writing at the expense of innovating. And so for me, I think making sure that the process is dynamic and I think we've seen that already that you know things are changing for the next round. That people have got ears really open and are mindful this is customer money, it's big chunks of money. That means there's scrutiny but it gives us huge potential, and that we think about how to make the sector, this process I guess, really resilient and sustainable as well. So you know that for me, I suppose is a is what good would look like longer term is that this isn't a, you know, flash in the pan, kind of boom and bust thing, but actually what we're sowing the seeds for here is something that creates a long term kind of culture of innovation. So I think it gives us yeah, huge potential. But there's some watch outs, I think as well.

**Arlene Goode** 25:32

We're seeing some activity happening in the past, you know, that three years ago, four years ago, we wouldn't have imagined would really have happened, don't we? So it's been great. So I mean, looking back, 2025 beyond, you know, what's the one thing that you think that the Fund could achieve that would make it a success?

**Niki Roach** 25:53

Yeah, I mean think we won't see loads of, you know what, so success is not loads of projects that have outputted loads of fantastic things, because some of these things are going to take time for all of Paul and I advocating for pace, practically some of these things will take time. So for me, success is more actually about perception, I think, which is grounded in reality. But the perception is that the sector, the water sector within the UK, is a place where innovation happens, that it attracts new talent, it attracts new ideas, those ideas come from beyond the sector, as well as within. So we're really seen as a place where if you want to, if you feel passionate about the climate and ecological emergency, or you feel passionate about social value, and the contribution that the sector makes to kind of leveling up and getting people out of water poverty, that this is a place that you can go and you can try things, and that it's open to that. And for me, if the competition shines a spotlight on the great stuff that's already going on and creates an environment where more of that can happen, then that's probably what success would look like to me, I think.

**Arlene Goode** 27:04

That's brilliant. What about you, Paul?

**Paul Connell** 27:07

Well, as somebody who's, you know, not really into the rhythm of the water industry and had to learn about AMP cycles. Even though Yorkshire Water are one of the sponsors of Open Innovations, I think that perception and culture of innovation, and being open to new things, and I guess if this means that people say yes, more than say no, that would be success. Why wouldn't we do this? Rather than, why would we bother? What's in it for me? I think that's got to be the change. So if I could see more of why wouldn't we do this new thing? And what's the benefit for more than just either the suppliers or the operators? That will be an amazing thing that we could see out of the challenge.

**Arlene Goode** 28:05

That's great. When we do that look back, who knows. So Paul, as someone who focuses really, most of your work outside the watch sector, do you feel that there are any key lessons, or practices and behaviors or whatever that would support the water sector to innovate?

**Paul Connell** 28:23

Yeah, I think where you see real great success is where people are, the more open people are, the more friends you make, the more fellow travelers you find and the quicker it is to develop stuff. So there's some you can look at the great work that's been done in open banking, and how that sector, which is regulated, pretty boring, and is managing to innovate very quickly. We're now seeing a lot of activity and energy being put into the energy sector. So you, if you look at the way the open energy work is happening, we're working with two DNOs at the moment, who are looking to do things differently, you know, take 80 page really detailed reports, turn them into a website, but create an update cycle, and change the way that they communicate and engage with their customers from meeting them in a parish hall and sending them a report and a sticker to sharing a website, answering their questions, but doing it at their pace. So they're letting people reach in to their organisation rather than them reaching out. I think there's some really good stuff to look at that. And then in terms of your infrastructure, I think if you look at the way that the construction industry is rapidly changing to a off-site construction, prefabrication, using data, I think there's a lot to learn from that sector as well.

**Arlene Goode** 29:57

That's brilliant. So that's learning from other sectors is really important and vice versa. So if we maybe just think about some of the entries themselves. So we saw four winning entries in this round, focusing on climate adaptation and reducing emissions and reflecting ambitious net zero targets. Niki, how important do you think these four entries or projects or initiatives will be for the sector?

**Niki Roach** 30:27

Well, I would, I would perhaps challenge your question, Arlene, in the nicest possible way in that, there's four obvious ones, but and they might be you know, I went back through the list last night, you know, triple carbon reduction, the energy balance, wastewater treatment, phosphorus removal and water neutrality at NAV sites. But then also you look at the flexible local water supply pilots, it's going to incentivise business customers to reduce their water consumption, which has a ginormous impact on reducing carbon through reducing obstructions and treatment and pumping costs. My overall reflection, I think, is that every single one of these innovations without question has an impact. And or could have an impact and a role to play in working towards achieving net zero. And, and I'm not, you know, I'm not trying to be airy-fairy, I really mean that practically, I think all of our actions and inactions have an impact. If we're pouring concrete, it has an impact, if we're talking to customers, we've got an opportunity to help them think about the value of water that we're providing, for example, which has an impact ultimately on the amount that they consume and so on. So, you know, we know the sector consumes 1-2% of electricity in the UK. We also know that heating hot water in the home consumes 6% of electricity demand in the UK, that's where 6% of our carbon emissions are coming from. So for me, I was really pleased to see that there were entries that thought about demand. I think all of the entries that are overtly thinking about carbon, I think the challenge is making sure we can measure, we can look at the unintended consequences as well and make sure that we're really thinking broadly. And I think it's not just about carbon. So for me, you know, I would say this, you know, as, as the kind of past president of CIWEM, we talk about climate and an ecological emergency, and those things are equally important. So focusing on net zero is, of course, critical. But I don't believe we can achieve net zero without thinking about the nature emergency that we have, as well. And some of those, some of the things that we will need to do to tackle that will be completely instrumental in achieving net zero. So for me, great to see the sector really focusing on that, I would argue that every one of those projects has a role to play. And even if they've not been explicit about it, there's an opportunity to go back and think about it and see where they have a role to play and they could maybe talk about that when they're communicating the projects.

**Arlene Goode** 32:55

Absolutely. And on to another subject really of. So we've, you know, there's the ambitions around climate change. There's also, you know, there was a lot of projects that involve technology, I think we've touched on that before, there was particular there was three really ambitious entry winning projects that focused on artificial intelligence, data collection and management. Niki, I'm going to pick on you again, what do you think are the biggest barriers to these new technologies, such as AI and machine learning in the water sector right now? I mean what do we need to do to overcome these and start with you, Niki and then we'll move to Paul.

**Niki Roach** 33:33

Yeah, I mean, I am not, I'm not an AI expert. I'm not a machine learning expert. I work with people who are so I asked them this question, because I thought that's really, you know, it's really interesting, I knew you're gonna ask me it. I thought, what do they think? And they replied by saying it's not really about the technology. And I think that's a really good point, you know, we can really see innovation as the development of technologies and products. But actually, it's about innovating through the whole of the value chain. So the way that we're going to integrate that technology, you know, how we procure it, and how you embed it into the organisation, and how you share that knowledge. So actually being really clear about the problem that we're trying to solve is the key thing. And then it might be machine learning, it might be AI, it might not be any of those things, I think that the barrier is sometimes creating an environment that is joined up enough that it can look for the right types of solutions. Rather than actually we haven't got enough data. It's never we haven't got enough data in my experience.

**Arlene Goode** 34:36

Paul, thoughts from you.

**Paul Connell** 34:38

Yeah, I think what's really fascinating, Nikki, I guess the build on that is that we talk a lot about new institutions and new institutional thinking and the way in which real time, always on, shared data creates a new way of thinking that moves away from a more directed approach to build some infrastructure, put a meter in, send a bill to somebody, and you have lots of point connections. When you start to monitor data, share data, create a an AI or machine learning model of your network and then link it to a catchment and then ask the Met Office to tell you when it's going to rain in six months time. You need to communicate that. But also you need a different institutional way of thinking. So what I'm hoping we start to see are new structures, organisations that allow the shared value to be created, shared and deployed, where you're looking at open, closed and shared data, open, closed and shared value. And as we talked about these anchor institutions that are present within our communities, I think there's going to be some ways, I'd like to see some innovation around the organisational structures and the ownership of that value that just doesn't sit with the people who built the data model or own the data centre. It must sit with the communities and the people's data that is being shared and used to do that. So it's a really hard question, but new institutional thinking, being more open, being more transparent and there's some questions in the chat about managing risks and managing people's value. The more open you are, the more transparent you are, the quicker you write down your plan, the quicker you iterate and let people share and join in, that is going to be the way that we do that. So it really fits with Niki's point there about new ways of approaching how we deal with these, the things that are going to happen and they are going to happen, right?

**Arlene Goode** 36:39

Yeah, that's a really good point. I look forward to seeing more of that coming out. So we're just I'm just going to wrap up now. Really interesting in conversation there, thank you. We're opening the next round of Breakthrough Challenge on Monday, 11th October. So Paul, have you got any advice for anyone considering entering in the next round?

**Paul Connell** 37:05

Well, maybe you can probably guess, but do it. I think there's also a point of actually making an application and just doing the thing of talking about innovation within your organisation will probably generate something. Whether it generates an application, it might not. But it will start a process of thinking about how we're going to do this, what we're going to do next. So just doing it is a really good piece. And then you picked up on my points around pace, risk, new organisations, new institutions, that's what I would be looking at. But that's just me. And then there's also Niki's great points as well, which I'll let her yeah.

**Arlene Goode** 37:40

Brilliant. Niki, any final thoughts?

**Niki Roach** 37:43

Yeah, I've got three, if that's alright. I thought about that, I was like, what would I say? I would say, right. So one is think about how you're delivering against the big challenges. Why did you join the sector? What is it that motivates you? Make sure that that passion comes out, I think, ground your entry in the difference that you're making. The second one will be considering risk comprehensively is important. It doesn't need to be low risk. But entries that did well this time around were ones where you got a good appreciation of risk. And then the third one I want to say is be bold in your collaborations, try and work as a sector and avoid duplication. Think about who else you can bring in, and really bring alternative perspectives and experience to the challenges.

**Arlene Goode** 38:23

That's absolutely great. And thank you so much, both of you for joining us at this event. And I look forward to hopefully seeing you next time. But I'll hand back over to Catherine. Thanks.

**Catherine Thompson** 38:38

Thank you very much. And thank you very much to Niki and Paul, especially. So we're now going to kind of jump into our showcase. So just to kind of so everyone knows what's happening. So we're going have a bit of a showcase of four of our entries, focusing mostly on primarily on transformation in the face of climate change, and building completely on Niki's point, obviously kind of so many of the entries do really kind of look at climate change and the outcomes of climate change as well. And we're going to focus on those four. And then after following that, we'll have a brief discussion with the people leading those projects, talking about climate change and the sector. If you do have any kind of clarifying questions for the teams, please do pop those in the Q&A or into the chat. And we'll ask the panelists to kind of answer those written. Following that all then we'll go through kind of three which are focusing more on kind of customer involvement. We'll then have a brief break, and then we'll talk through the potential for digital tech to transform. So we've got kind of two final ones before kind of close and next steps. So I'm now going invite the triple carbon reduction team to come off mute, turn on their videos, and please take it away.

**Adam Brookes** 39:51

Hi, good morning. Thanks, Catherine. And good morning to everyone here. Absolutely delighted to be able to share some details of and an overview I guess of our bid. And thanks also to Niki and Paul for those those insights and views. We'll be taking those away and considering how we can build some of that advice I think into our delivery. Pace being an absolutely key one when we consider the climate emergency and work to achieve carbon net zero by 2030. So if we can just have a quick run through of our project, and also just as the partners within the project as well. So triple carbon reduction, I guess as a, as a subject, maybe is alluring but doesn't tell you too much about what we have planned. So as a bit of a spoiler it includes work on on hydrogen generation, greenhouse gas emission reduction, and also energy efficiency through treatments. So I'm Adam Brookes, I'm Manager of Innovation Discovery at Anglian Water. I think Niki mentioned around go with what you're passionate about and certainly for me, the energy use and carbon emissions associated with those and directly from our operations is something that's run through my career at Anglian, so yeah. Just hugely thankful that the bid was supported and now the work really begins to deliver on that. So we're joined by our partners bringing strength and depth and experience in these areas. So we're joined by Severn Trent, Scottish Water, Northern Ireland Water and United Utilities, as our water company collaborators. And then also OxyMem, Jacobs, Element Energy, and three universities in the form of Cranfield University, Brunel and UEA. So, given the scale of the challenge that we have, water companies have committed to various timelines, I guess, for carbon net zero. But certainly in England, 2030 was the date that we're aiming for. And again, on pace that's 2030, to deliver it not to work out how to get there. There's some really key areas in which we need to innovate. And actually, I think drives transformational innovation within the sector, as well. And some areas that will have reducing emissions by other sectors, efforts as well, such as energy. So some key ones through there that I'll bring out as I go through the talk and talk about some areas in a bit more detail. So it's a bit of an overview. For those that aren't familiar with the bid or maybe read some of the press releases. Just in three areas of carbon sources of carbon emissions in our operation, we still utilise a fair amount of carbon-based fuels within our transport operations. And that's an area that is considered to be actually quite difficult to decarbonise for our HTV sector. And again, a region as large as Anglian's and 1100 wastewater treatment works within our operating region. There's a lot of miles traveled and say carbon associated with those, as well as those we have, we still utilise fossil fuels in standby generation at lots of our sites. And, you know, we will be looking for alternatives to decarbonise those in the future. Probably one of the greatest challenges to achieving net zero by 2030 is around the direct process emissions coming from our processes. These includes both nitrous oxide, which is 300 times more global warming potential than carbon dioxide, but methane as well. And the next project and presentation you'll hear is another alternative to reduce that. And then finally, we are, as Niki said earlier, a significant energy and electricity consumer for all of our operation, but indeed, wastewater treatment being one of those dominant areas. So just to share a quick photo with you to show again, for those that may not seen it, this is the activated sludge process. And I think probably, was it five or so years ago, maybe a bit longer than that now, we celebrated 100 years of activated sludge, so that's maybe a bit flippant it's been a really important mainstay process of our industry. But if ever there was a need and an opportunity for transformational innovation, maybe this is one of those. So what does our, apologies I've just jumped up.

**Adam Brookes** 44:33

Okay, so what does our project include? Well, essentially, the future states from that earlier picture that I showed, includes those three areas of change, hence the name triple carbon reduction. So at the centre of all of this is green hydrogen generation from electrolysis. And importantly, for our bid, we're looking to utilise final effluent rather than potable water as the feedstock for that electrolysis process, because we're also aware, and especially I guess in the east and southeast of the UK, we're at a very pressured situation in terms of water resources and that supply demand balance. So if we can utilise treated final effluent as the feedstock for that we, we can look to take that pressure away from that developing industry. Alongside generating hydrogen, we also generate oxygen. And that gives us another opportunity to move that core wastewater treatment process to something that resembles next generation treatments. And in our case, it's something called a membrane aerated biofilm reactor. And really simply you will have seen in that earlier photo, quite a lively surface on the water within the process. And that's because we bubble air through this process to supply the oxygen to the microorganisms that carry out that treatment. In contrast, with an MABR, we actually diffuse the air or oxygen through that membrane process directly to a biofilm. So massive step change in efficiency available in doing that. But also, and this is the really important bit, the area around that direct greenhouse gas emissions and, as I said, specifically nitrous oxide from the process. And by doing this there's some really clever science around how it could work, we are looking to move towards zero nitrous oxide emissions for the sector, which would be a massive step change in a very, very difficult area that we're looking to innovate around. And then finally, the third part would be to utilise that generated hydrogen. For in the future, a number of uses and the UK hydrogen strategy sets out some of those. For our project, though, because of the scale it would be to generate hydrogen, compress it on site, then utilise it in our standby generation, there's some really, really promising technologies around that utilisation, which we're looking to bring in. So finally, just to kind of summarise and finish. All of the companies within the UK and Ireland have a plan for net zero, but I haven't seen one yet that doesn't include some form of residual emissions. And the pie charts on the left hand side show through the reduction in size from our baseline year of 2018/19 to 2029/30, that our overall emissions will reduce but significantly, there are still residual emissions. And actually, I think we may have undersold the project slightly in that we, we attempt to address four areas, not three, so maybe it's quadruple carbon reduction, since the hydrogen in the future and aligned to the UK hydrogen strategy can be used not only in vehicles, but potentially in fuels if it's injected into the gas grid, or from direct usage. So thanks ever so much. Great to have gone first. And I think there's a chance for questions and discussions at the end. Thank you.

**Catherine Thompson** 48:01

Thank you very much. I now invite the transforming the energy balance of wastewater treatment team.

**Ben Martin** 48:14

Thanks. Thanks a lot. So wastewater treatment typically contributes 30 to 40% of a water company's carbon emissions, mostly due to the release of nitrous oxide and as Adam mentioned, this is a greenhouse gas 310 times worse than carbon dioxide. I'm Ben Martin, Lead Research Scientist at Thames Water, and in collaboration with six other water companies, Welsh, Southwest, United Utilities, Scottish, Yorkshire, Northumbrian and the University of South Wales, we are setting out to transform wastewater. Cold anaerobic treatment processes have the ability to reduce greenhouse gas emissions by 98%. Potentially making the single largest contribution to our net zero journey. And by reducing electricity consumption by as much as 80%, the process will reduce operational costs helping to keep customer bills low. In the UK, extensive research has been undertaken to explore how anaerobic processes can be adapted to suit a cool climate. This has culminated in several pilot projects treating wastewater for up to 1000 people. I'll hand over now to Michael.

**Michael Gerado** 49:19

Thank you, Ben. I'm Michael Gerardo, Principal Scientist at Welsh Water. We have built our first plant for low treatment or anaerobic treatment for a demonstration plant that built Wales, which has been treating settled sewage for a couple of years now. To make the technology more beneficial for small sites, what we propose is to adapt the demonstration plant to treat crude sewage. This will allow the removal of a treatment step and a reduction in sludge production by up to 96% which will make the movement of sludge for treatment at other sites almost redundant. Successfully demonstrating this configuration will open an opportunity for a resilient, low cost solution for small rural sites. Over to you, Sandra.

**Sandra Esteves** 50:12

Good morning, everyone. I'm Sandra Esteves. I'm a Professor in Bioprocess Technology for Resource Recovery. And I work on energy and materials. I work at the Sustainable Environment Research Centre at University of South Wales. In this project, we are very interested in investigating the fate of carbon and the recovery of nutrients. Unlike aerobic wastewater treatment processes where nutrients can be recovered currently with carbon, anaerobic processes that will directly at will not directly remove ammonia and phosphorus. Therefore, we will be working with project partners to explore opportunities for recovering nutrients for beneficial reuse. Very importantly, we will be undertaking a full lifecycle analysis of the processes being piloted and demonstrated to validate its benefits that we believe are achievable. So in more detail, we'll be examining the performance of processes, not only in recovering and removing contaminants that are currently regulated, but also we'll be looking at pollutants of emerging concern such as pharmaceuticals and microplastics as well. We'll also be investigating the fate of antimicrobial resistance within these novel process. We believe that this research will provide valuable insights for cold anaerobic treatment, and a selection of conventional processes, which will be monitored concurrently. Over to you, Ben.

**Ben Martin** 51:49

Thanks both. So in parallel to those efforts, at Thames Water we're going to be developing a mobile pilot plant for testing on a cross section of sites that represent the UK water industries asset base. And these experiences will then be used to design and build a demonstration plant. And the final outputs will be a series of design guidelines that will enable the water sector to deploy the technology efficiently and effectively. Cold anaerobic treatment has the potential to serve most of the UK population. Funding from this Ofwat Challenge will allow us to accelerate the adoption and rollout of the technology. We and our partners have already invested significantly in the technology and continue to show commitment through financial contributions totaling about 30% of the project cost. Together, we believe our consortium of seven water companies and the University of South Wales can transform wastewater treatment, to deliver better outcomes for our customers, for society and for the environment. Thank you.

**Catherine Thompson** 52:48

Thank you very much, Ben. I'll now welcome Michelle and the team focusing on flexible local water supply pilot.

**Iain McGuffog** 53:03

I'm Iain McGuffog, I'm Director of Strategy and Regulation at Bristol Water. So I just want to give a quick introduction to the flexible local supply scheme, because it's an unusual project. So this project is trying to fix something actually, we've been talking about in the water industry since 2003. There's been the potential for small package treatment plants to inject water into a supply network. And we think that that those smaller package solutions, a bit like the diversified energy market and how that's changing, could actually give us more flexibility at peak, rather than just relying on big regional solutions. And the way that market will work obviously needs investment, and to get that investment we need a pilot project that helps to find out how we can deliver that those benefits to consumers and the environment and make it commercial schemes that people are willing to invest in. So this is maybe an example of regulation, regulatory innovation that we were talking about before. So what does that actually involve then. Hopefully the slide changes.

**Iain McGuffog** 54:23

Ah brilliant. So to fix that market, and to actually enable smaller, maybe carbon neutral package plants to come online. We've got to think about the value chain and in this case, for this pilot project there's some spare water at Dicot which RWE can supply, some water resource there. With Bristol Water's expertise, we can work out how to treat that water. Plug it into a distribution system for this project before we work out where to scale it up. That be into Thames Water's network. And actually also, there's potential here to make it a commercial scheme in its customers and of Castle Water, that means actually, can we provide incentives to business users at peak to use different amounts to actually make sure we get the best value out of these sort of pilot plants. So this project is really looking at the regulatory barriers, the commercial barriers, to overcome this, to make this investable. And actually, we'll find out whether this works or not. And you know, it has been on the cards for 20 years or so. So let's have a go at this for the Innovation Fund and see if we can make it happen.

**Michelle Davies** 55:51

Thanks Iain. Hopefully you can hear me without an echo. So I'm just going to give a brief overview of the benefits to customers and the environment. Really as a segue to our partners who you'll hear from shortly. So if you think about how we do water resource planning in our industry, we're really planning for extreme, quite rare events. And that means we're building a lot of redundancy into our system. So imagine a world where we can use our existing obstruction licenses, repurpose those and use them during times of drought. So in the case of our pilot plant, we would be switching water use from energy production to potable water use. So we could do that during kind of extreme years when customer demand was highest. And then build on top of that, an effective market for non-household water efficiency and you've got yourself there a game changer potentially for the water industry. So big central cost savings and environmental benefits, including carbon reduction. For some reason the button doesn't work to go down, let's try the mouse. There we go. Right. So we've got some really impressive partners on our project. And it's supported at a very senior level within each organisation. There's a bit of a delay and you're going to hear from them all shortly. What I will say is this partnership has been a very long time in the making. We've been talking about this for a number of years, so it's great to have this opportunity to test it through the Innovation Fund. Please shout if you can't hear from our partners when I press play.

**Mel Karam** 57:32

Facing new dual and conflicting challenges of climate change and net zero carbon on one hand and provide to being sick water supplies into the future in the face of growth in the population. And in my view the issues are not being given the urgency that they need. We need action now. Governments and regulators agree that market-based solutions are the way to go ahead. And yet here, 20 years after the legislation was approved to allow the market to solve some of these problems, there are no more independent water suppliers providing water into water companies' networks.

**Roger Bewley** 58:32

Is a major participant in the UK electricity sector is keen to make full beneficial use of its water resource. In addition to using it to cool its power stations as now, we want in the future to share it as a feedstock for public water supply. To do this, however, we faced four principal challenges, and these include a lack of direct statement of need, funding model limitations, opaque pricing and network access constraints. This innovative water sharing project will act as a test to systematically work through these challenges and recommend solutions.

**John Reynolds** 59:17

Currently without flexible use of resources, there's limited scope for retailers and customers to benefit from investing in business water efficiency. By opening up the market for resources, retailers and customers can work together to identify the scope for additional savings on a long term basis. And this creates new opportunities to manage demand for water during droughts. The potential to use multiuse licenses is a really exciting direction.

**Scott Aitken** 59:56

Binnies are delighted to support this disruptive Innovation Fund project. The project aligns very well with the Innovation Fund themes by creating disruptive commercial models in a critical area of water resources. That is timely, as this innovation is needed know to undoubtedly help us solve the water scarcity and environmental challenges that lie ahead. And that can be scaled so that we can use this nationally.

**Michelle Davies** 1:00:33

Hopefully we've got Chad on the line as well to voiceover his slide. Chad, are you there?

**Chad Staddon** 1:00:41

I am indeed. The potential to use multiuse abstraction licenses more flexibly is an exciting alternative to shortage on the one hand, and large expensive capital works on the other. The potential benefits to water consumers, the environment and society are huge. UWE Bristol is excited to provide academic and technical input across the project, particularly related to cross-national comparisons. What can we learn from experience elsewhere? Regulatory legal blockages and challenges to achieving more flexible abstraction licensing and thinking through pathways to scalability of the trial pilot scheme. Thank you.

**Michelle Davies** 1:01:23

Thanks, Chad.

**Michelle Davies** 1:01:26

So you heard from all of our partners there. Luckily, we weren't being tested in this bid on our technological capability. I think we would have failed. But we got there in the end. So thank you, everyone. And that's the end of our presentation.

**Catherine Thompson** 1:01:39

Thank you very much. I now invite the alternative approaches to phospherous removal at rural wastewater treatment works. Lisa, please take it away.

**Lisa Mansell** 1:01:49

So thanks for having us here today. I'm Lisa Mansell, Chief Engineer for Innovation at United Utilities. I'm really proud to be here sharing the alternative approaches to phosphorus removal at rural wastewater treatment works project. This is a partnership project between Southern Water, Thames Water and the University of Portsmouth, alongside our electric regulation partners Power & Water, Evergreen, Kolina and Hydro Industries. So why do we need these alternative approaches? Well, the UK water industry has a huge reliance on chemical coagulants for phosphorus removal, but particularly at small rural treatment works. We have a massive number of those to deliver new phosphorus drivers in this AMP. But we're seeing more of those coming to for the future AMPs as well. And we need to remove, we need alternative approaches to improve the water quality of our rivers. As I said, we've got a number of drivers and we can't be reliant on chemical coagulants for all of this. We need to reduce our carbon impact, we are estimating a five fold increase at rural works in AMP7 in terms of the amount of carbon emissions that are coming from dosing of metal base coagulant. So moving us up to a kind of whopping 1.2 million kilograms of CO2 equivalent per year in terms of chemical use, just at the small treatment works that doesn't include the alkalinity correction, and that doesn't include the emissions that come from the production of those chemicals as well. And to reduce our impact on rural communities, dosing at small rural treatment sites means that sites which have got new phosphorus permits, they're going to start to receive tanker deliveries that's traffic in rural areas where we'd like to reduce that impact on our customers. And we need to provide greater operational resilience. We all know the impact of delivery shortages at the moment. And that impacts the wastewater processes in terms of use of chemicals. But equally how volatile the market chemicals market is and the impact that the massive increase in phosphorus drivers has on our use of chemicals and strain on that supply. And so really, this is a key project for us in terms of improving the sustainability of phosphorus removal at small works, trying to find solutions that can drive down the costs of doing this at very small sites, and really to provide lower bills for our customers and then also to really give us more operational resilience. And obviously that big carbon impact of dosing. So what are the alternative technologie? Well we're working with our partners. I mentioned before our elctro-coagulation partners to deliver our work package centered around electro-coagulation. We have a work package on bio-based or natural coagulants and another work package on reactive media and for all the water companies that are on the call today, people working in the water industry, these won't be that new the these will be technologies you're aware of. But water companies are struggling to take these from great ideas into real projects. And mainly that is around the lack of long term operational data, the lack of maintenance opex, and the carbon impacts of these solutions. Really we need some more information to get comfortable with to move this forward. So in terms of acting fast, this is about us getting market ready technologies available to the water company as a tool for their toolkit. We're really excited that our electro-coagulation trial will be the biggest of its kind that we're aware of. Pitching four suppliers side by side, and then there'll be a market leader and then some

**Lisa Mansell** 1:05:51

other companies that are trying to enter the market and to get more confidence in these solutions and to compare the differences between them. Our bio-based coagulants, we'll move from quickly jar testing and understanding the priority coagulants that we can move forward to then into a pilot trial at United Utilities, Ellesmere Port wastewater treatment works. And then we will look to see how they can complement our existing chemical base or if they could replace private completely and the carbon impact of using those. And then finally, Southern Water and Portsmouth University will lead for us on the reactive media work package, where we're looking to really drive out an industry standard. We've all or most of us have done work on reactive media. And those solutions are really still not coming through despite a real interest in them. It's still early days for us as a water industry and driving out an industry standard and having a mobile test rig not just for the water companies, but for new entrants to the reactive media market will really really help us to drive forward these solutions more quickly. And just to summarise, we've been delighted to be awarded around about £2.8 million from the Fund. We have a program that kicks off already. And we're underway with that now and we will be delivering early results as soon as we have them. And our project runs until August 2023. As I said, we've got a good steering group of our partners but we also have lots of advisory members in C2V+, Yorkshire Water, and Welsh Water and Stantec will be supporting us with the reactive media standard as well. So we think we're really set up for success, we're really keen to get going and eager to start making a difference in terms of the sustainability of phosphorus removal at rural wastewater treatment works.

**Catherine Thompson** 1:07:50

Thank you very much team. We are getting quite close to time. So actually now I'm going to ask each of the entries that have just spoken for one person to from those teams to turn your cameras on and just reflect on the one thing that you're most excited about, from your project or from the Fund. So Lisa, why don't you kick us off. One thing you're most excited about with either the Fund or your project.

**Lisa Mansell** 1:08:23

I think for us, the excitement of the Fund is for us to be able to progress innovation much more quickly than we could have done with our individual innovation budgets, and to bring us all together and to collaborate and really just to drive forward innovation much more quickly than we've ever been able to before. Thank you.

**Catherine Thompson** 1:08:48

Thank you very much. Michelle, I'm going to put you on the spot for yours. What are you most excited about?

**Michelle Davies** 1:08:55

Thanks, Catherine. I think for me personally, it's the opportunity to work with some really great people in organisations that we may not normally work with on a shared challenge. And I think it could be a real game changer. So I guess it's that personal connection and learnings for me that'll be really exciting.

**Catherine Thompson** 1:09:17

And Ben, Michael?

**Ben Martin** 1:09:21

I'll go yeah, so I'm really excited about just being able to catapult this idea of cold anaerobic treatment, being able to make a mobile pilot so we can actually test it on a variety of different wastewaters within the UK. And that is really going to accelerate our efforts on this. So it's the collaborative nature of it that we're now being enabled to do.

**Sandra Esteves** 1:09:49

Catherine, if I can add. Just move away from secondary sludges will be very exciting. So that's probably the highlight of the project I think.

**Michael Gerado** 1:10:04

I'll come just share my opinion. I think what's really really exciting is the co-creation, is the fact that we've been able to negotiate and gather around issues that we're all experiencing. I think that's been quite unique to see so many partners coming together very very exciting.

**Catherine Thompson** 1:10:31

Go ahead, is it Adam.

**Adam Brookes** 1:10:34

Well being last I think in this group, what everyone else said plus also just scale and pace I think. So the exciting thing is the passion that kind of that everyone has in our, in our projects around this subject and the injection of funding allowing us to move at pace and scale with those partners in that collaboration. So yeah, now the work really starts doesn't it. Thank you.

**Catherine Thompson** 1:10:59

Thank you very much. Okay, so now we move on to our second group of winning entries. Again, many of these entries are also focusing on a big focus on climate change. But what is really exciting and brings them together is the involvement with customers in their entries, and so I'm going to invite firstly CaST Co., the catchment thinkings and customer catchment systems thinking cooperative to take us away. Michelle please pronounce your name of your project much better than I can.

**Michelle Walker** 1:11:33

Easy for you to say. Brilliant, thank you very much. Yeah catchment systems thinking cooperative or CaST Co. and yeah, myself and Amina Aboobakar are going to tell you all about it.

**Amina Aboobakar** 1:11:47

Thank you. Hi. I'm Amina Aboobakar. I work for United Utilities. And I'm also seconded to the Rivers Trust as their Commercial Director.

1:11:55

And I'm Deputy Technical Director at the Rivers Trust and we support the catchment-based approach and work with, you know, a whole network of member trusts across the country.

**Amina Aboobakar** 1:12:07

So why are we interested in delivering this project? This is very much about minding the evidence gap. Currently, we have a huge gap in environmental data monitoring, and limited availability of robust evidence at national scale. And this unfortunately leads to a fragmented decision-making and that's having a direct impact on our customers because it creates blind spots for water companies and obviously to our customers and others that we interact with at catchment scale. And that's driving siloed decisions, leading to poorer outcomes and less value for money. And in many ways, with this data gap, what we're seeing is limited benefits that could be harnessed for customers, society and the environment. And this is why we're doing this project because we believe it will drive transformational change, starting from a community level and therefore from a customer level up. We'll create a structured and collaborative national framework for governance and standardisation of catchment monitoring, modeling and data sharing. And this is about integrated data management and better monitoring of national and of natural and social capitals for better informed decision. And of course, working with our customers at that local scale, we will be recruiting people at local scale to deliver 15,000 hours of volunteering time to monitor over 1000 square kilometres catchment area per year. And all of these volunteers are all customers of all the water companies that are involved in this project. And we want to use this to engage our customers in issues and solutions to manage our water environment better. We're proposing to demonstrate the value of this framework in a) to demonstrate the catchments across England and Wales, covering quite a substantial patches of different water companies. And we want to test this framework under different conditions and of course, adjust to local needs. And it wasn't very hard to make this a highly collaborative project. Everybody sees the point of it just going back to some of the some of the discussions with the panel before, everybody sees the point of it. And the question why was why wouldn't we do this? This is a highly collaborative project. We've got 12 water companies involved across England and Wales, various environmental NGOs and of course the Rivers Trust being our core we'd partner in that and academic partners as well in a total of 24 named partners and I won't name every single one of them but that's quite a walk. And plus all of our on the ground, local partners from catchment-based approach partnerships, to local communities, customers, landowners, government departments and agencies as well as businesses. We're hoping to run this project over three years and total estimate is just over £7 million. Thank you.

**Michelle Walker** 1:14:59

And yeah, as Amina says we're building a national framework for standardizing particularly citizen science preaches really engaging communities and this, and the reason that's needed, there's some really fantastic examples around the country of citizen science evidence really being used to inform local decision making. But the picture is really fragmented, it's really hard to build these national decision support tools and models to pull that data in when there's no standardization, so that's one of the key things we're trying to tackle, and also properly resourcing and training, that local evidence gathering and interpretation activity in the catchment partnerships and member trusts and all of these sort of community level organizations that need to make this happen. So you know, it's really innovative in terms of the sort of scale of building that framework. And also, in terms of the collaboration, you can see from the list of partners, you know, this is big, and we're engaging, potentially the whole of the sort of Kava network as well. And that's really key. Also, that we're engaging the customers working closely with those project partners, to do some really exciting things like collaborative modeling that we've tested in little pockets around the country, but now we're gonna really standardize this, so we can roll it out at scale and pace, as you've heard. And, you know, tackling these wicked problems of climate and ecological emergency, it really requires it requires an adaptive management approach. So you know, trying something, failing fast learning from it and going back and changing what you do. And you've got to have really good quality evidence base to improve that and we know that the national evidence base that we've got to base these decisions on isn't good enough at the moment. So this is about really building a richer and more consistent picture of what our natural capital is, what the state of it is, and where we need to prioritize and invest in that nature recovery. And because it's applied locally, it's really strengthening that sort of community in place based planning, and getting ownership of it, and you know, we know that our project is going to benefit customers and the environment and society and it hits all of those five Ofwat strategic innovation themes. And the wider social and economic and reputational benefits are also big through opening up new ways of engaging customers and creating lasting behavior change. And we've got potential wider health and well being benefits connecting people to nature, improving jobs and skills prospects, and engaging customers from all walks of life, we're ensuring that diversity and inclusion are at the heart of this framework. So engaging young and old and deprived in affluent communities and rural and urban inner city areas, to really build that framework from the grassroots up. And really, this is, you know, just emphasise it's an innovative collaborative project. It's ambitious, and the framework, but it's going to create is going to transform the role of customers into citizen scientists. And we want this to make a long-lasting difference. This is the start of you know, big transformational change. It's not going to be over in three years, we want a big step change, and this is going to leverage partners come in with this, and to really give power to the people give that decision making power to the local communities through better data and evidence. Thank you very much.

**Catherine Thompson** 1:18:41

Fantastic, thank you very much. Now pass on to the Fair Water Project.

**Chris Jones** 1:18:51

Hello, thanks, Catherine. I'm Chris Jones. I'm really excited to be leading Northumbrian Water’s project and transforming customers’ lives, integrating pathways to fair and sustainable water or fair water for short. Our consortium is made up of partners at Newcastle University, to bring research excellence in computing, engineering and behavioral science. Northern Gas Networks are leading the gas sector's journey to net zero and pioneering the UK hydrogen network, Procter and Gamble a global leader in customer centered product development, task based customer insight, and National Energy Action a national charity working directly with customers and communities to end fuel and water poverty. So, we're a unique, diverse partnership, whose mission is to engage everyone in a fair transition to net-zero and pioneering joined up approach to water and energy efficiency, affordability, and health and wellbeing. We recognize the challenges in encouraging people to substantially change their behaviors, the products they use, and the very fabric of their homes. But we share a clear vision of how this will be achieved. Fiona Townsend from Procter and Gamble, but firstly, NEA's Jess Cook will explain more.

**Jess Cook** 1:20:04

Thanks, Chris. And we know that there are many links between energy and water often described as the energy water nexus. But no two individuals are the same or use their energy and water in the same way. And this is why fair water is unique because we will explore the energy water people Nexus, developing pathways tailored to individual circumstances and characteristics, recognizing that we all have our own personal barriers and challenges, and are each motivated differently. Taking this understanding and aligning it with consumer insights from our solution testing, we can develop some tailored solutions to task based water and energy efficiency, finding the pathway that really works for an individual household, reducing household water consumption, and aiding a fair transition to net zero, all while protecting the health and the well being of the people that we serve. At NEA, we support some of the most disadvantaged people in our society, they are choosing between keeping warm and putting food on their table, or between paying their water bill and buying new shoes for their children. We know that they won't be motivated by reducing carbon and know that they can't pay the upfront costs of these technologies. Yet, they're the group who could benefit the most from the savings that these solutions could provide. fairwater will identify the interventions that are needed to bring these hard to reach customers on the journey to net-zero will be able to understand the impact of the solutions that we test on all aspects of an individual's home life, whether they're vulnerable or not identifying areas for improvement, and feeding them back in through an iterative design process, resulting in core design solutions which meet all customer's needs, regardless of the circumstances they may find themselves in.

**Fiona Townsend** 1:21:49

But, we all know changing behavior is hard. P&G products thinking things from laundry powders to shampoos are used by about 5 billion consumers globally each day. We know that to make habit change stick, we need to reach consumers at an emotional level as they go about those daily tasks and give them solutions that mean that they don't have to compromise, say between their water use and how clean their clothes are or what it costs them. Fair Water will help customers transition to sustainable behaviors at the level of tasks in house that are water and energy-intensive, such as laundry, dishwashing, and where the consumers are consciously making decisions. We will do this through a combination of behavioral change approaches, innovating products and services customized for these consumers. And this will be at P&G own cost. And thirdly, vibe quick iterative cycles of build, measure learn with customers to create consumer-led solutions and not technology pushers.

**Chris Jones** 1:22:55

So Fair Water offers great value for customers leveraging NGN's two million pounds unique customer energy village. BMG is 1 million pound investment in product development. Newcastle University's National Innovation Centers for data and aging and NEA is trusted relationships with over a million supported and engaged customers and their extensive network of stakeholders, from policymakers to boilermakers. So these unique collaboration brings knowledge, resources and connections that are essential co-creates electric solutions with customers that work for customers to develop products and services enabled delivery at scale, and to support customers, including the vulnerable and hard to reach through changes that will deliver a better quality of life for them, and the outcomes that society needs. Thank you.

**Catherine Thompson** 1:23:46

Thank you very much team. And then finally in this section, I'd like to invite Water Neutrality at NAVs to speak.

**Ed Barnes** 1:23:57

Good morning, everyone. So Victoria and I are incredibly excited to present on behalf of all of our fantastic project partners. And you can see behind us we're going to go through the full list, but they know that they're just as excited to share our innovation story with you all as well. So our project will deliver the world's first at-scale water neutral housing development in collaboration with NAPs. So working across three identified nav sites, Affinity will lead this collaborative project to go beyond sustainability ambitions and ensure that approximately 3000 homes are measurably water neutral. So the intended outcome of the project is that we are managing increasing demand on our network sustainably whilst ensuring resilience and operations and protecting local environments. This will also ensure a more competitive market by facilitating market entry for NAPs, a challenge that has today to be addressed by the industry. So why is this innovative? Well, it's the world's first at-scale water neutral site. There are a number of water efficient housing developments, but none are water neutral. We will also be installing innovative IoT-connected technologies, including rainwater harvesting greywater recycling water-saving devices, from showerheads to sensors, to even to urinals. And we will be combining these technologies via a single user interface, enabling that data to be shared, and customers’ behavior to be changed by our app. We're also seeking to solve the industry challenge by addressing the regulatory policy process and behavioral barriers to competition with our water neutrality blueprint. So collaboration has been key, and we've brought together the very best from across and from outside of the industry. In addition to our innovative partners, approaches, and products, we have also appointed an independent steering committee, chaired by the CEO of Affinity Water, Stewart Ledger to oversee the project. This steering committee is made up of industry leaders and will provide robust challenge and oversight of the project, while also acting as ambassadors for water neutrality and driving innovation and the breakthrough fund. So the water industry benefits are clear. So for companies, self-sufficient new builds could solve the supply resilience challenges, the increased demand on the network is creating. For now, it facilitates access to the market and strengthens partnerships. And for the water industry, it tests the financial and operational business case for large-scale water neutrality. The benefits to customers include better choice in water service provision, alignment with their sustainability values, and also cheaper bills.

**Victoria Nevin** 1:26:49

Yeah, so as we've already said, this project represents a world first, which is so exciting to be a part of, we'll be delivering the world's first at-scale, water neutral new development in collaboration with our NAV partners, we've got three sites of approximately 1000 homes each and across these sites will firstly minimize water demand, and then offset any remaining consumption. Using a combination of innovative technologies and customer behavior change. The total water use in the defined region will be the same after the new development as it was before. We identified three NAV sites to better spread the risk and show we can test the core drivers of wash neutrality. So site 1) is going to be our technology installation in residential homes. Site 2) is going to emphasize a community-based approach to offsetting demand, and site 3) will offer a hybrid solution. Customers across the sites will be able to monitor their usage via an app, which will also allow detailed monitoring and analysis of anonymized trial data. The collaborative project will go beyond current sustainability ambitions and ensure homes are measurably water neutral. We've partnered with NAVs in this project to prove the commercial and operational business case for both the incumbent water company, and the new entrant for at scale water neutrality, and this project will allow Affinity Water to test an approach to sustainably manage increasing demand on our network whilst ensuring resilience in our operations and protecting local environments. It will facilitate better access to the market for NAVs. It will strengthen delivery partnerships and water-efficient technologies. And it will share the learnings across the sector by the publication of a water neutrality blueprint document, which will encourage a more competitive market. So just to reiterate on the key outcomes that we expect to achieve the delivery of three water neutral new development sites, which will save over a million liters of additional demand today, the development of a water neutrality blueprint, which we'll share across the industry and enable others to join the water neutrality journey, partnering with customers to design the water neutrality solution that meets their sustainability expectations. And understanding the opportunity that water neutrality can contribute to enable the implementation of a clear roadmap to net zero.

**Ed Barnes** 1:29:17

So we just wanted to say a special thanks to our NAV partners who have backed our shared water neutrality ambition right from the start, and to our industry specialists and technology partners who have offered us their expertise, insights, and importantly materials at cost that have enabled this project to happen. Thank you.

**Catherine Thompson** 1:29:40

Thank you very much. And now I'd invite everyone else who's just presented to turn their videos back on and we'd have a bit of a discussion about some of the things that are really exciting in the space. Victoria or Ed, which one of you wish to go first; I was going to say, do you think that customers are more excited and I've tried to engage more in the word sector. And if you think yes, why do you think that is?

**Ed Barnes** 1:30:06

So I think we've demonstrated some of the other work we've got going on in this space at the moment that customers are excited to engage with water and water efficiency. We've got an SOS campaign, which has reached an active participation of more than 10% of our customer base in less than six months. So nearly just under 150,000 people have signed up to actively participate in a water efficiency campaign. And I think that really shows the appetite from within the core customer base.

**Catherine Thompson** 1:30:37

Why do you think that is, Ed?

**Ed Barnes** 1:30:40

I think there's been a huge change over the last 12 months. And I think people have really sort of looked at the environment that's around them, particularly during lockdown, when people were already able to exercise in their very local community. So there's much more sort of buy into the story and the journey of the water that comes out your tap comes from your local community as part of where you come from, and people want to protect that environment. And I think also, alongside that you've got sort of wider global sustainability goals. You've got Greta Thunberg, I think we've got real active participation from children as well.

**Catherine Thompson** 1:31:15

Thank you very much, Ed. Michelle or Amina, in terms of kind of rivers, is that what you're seeing also?

**Michelle Walker** 1:31:23

Yeah, definitely we, you know, we've seen a massive kind of uplift in the interest, particularly from the media at the moment, we've just published our state the rivers report, and you know, where we're getting so many follow ups from that people want to know, what can they do? You know, and that's why we love what we're sort of building here. And it's, you know, we're so grateful for the opportunity to really take this off now and make a difference and engage people in the solutions is, I think, you know, it's very easy to feel overwhelmed and helpless with this, you know, the sort of joint crises that we've got with climate and ecological emergency. But, you know, Rivers Trusts’ grassroots organizations, they want to get, you know, feet wet feet, and get people engaged. And I think, you know, working with Amina and United Utilities, we can turn those customers into the into the citizen scientists that can really help target nature based solutions that will, you know, reduce flooding that will clean up our water quality or help sequester carbon and restore biodiversity. So I think there's a really direct link between what people can do through what we're proposing and the solutions that are going to help tackle this.

**Catherine Thompson** 1:32:37

From a different, a slightly different angle, Jess, what are you hearing from customers that you work with, as part of your work at the NEA, in terms of kind of engagement with the water sector.

**Jess Cook** 1:32:46

We get some very, some very mixed feedback, I'd say, in regards to customers' views. And those customers that can access things like affordability support, have a lot of praise for their water companies. And you know that they recognize that, and water bills aren't just the only thing that they struggle with their struggle with a large number of bills. And actually, in the current climate, with the energy crisis, as it currently stands, that's just growing. And so any help that they can get is, you know, something that's really useful to them and makes a large difference, this project that we're talking about, has the opportunity to do that on a larger scale, and over a longer term. So it wouldn't just be direct financial support, it's actually helping people to access the solutions that they need in order to be able to reduce their water use and contribute towards net zero and fighting climate change, but also to address their own motivations. So if they are struggling financially, and then we can, we can address that. And we can try and help them save money. If they aren't, and it's around time pressures or around, you know that they've got a real interest in doing things for the climate. And you can approach it in that direction as well and find solutions that fit for them. So it's all about tailoring the solutions. I think, if we can do that effectively, then people will really engage with us.

**Catherine Thompson** 1:34:08

Thank you very much, again, Fiona, on a slightly different level, thinking about kind of consumption and the products people use when they're working with water and household appliances. What are you seeing from a customer perspective, relating to kind of their water use in the home?

**Fiona Townsend** 1:34:26

So I think it's a really interesting question. I think that I think broadly, I think people are becoming increasingly environmentally aware, and increasing concerns on sustainability. And obviously, we look at that quite broadly beyond just water and P&G. And I think the one of the things that often strikes us is actually water is relatively low down on the list of consumers concerns, in fact, when it comes to the environment, and that's something that I actually think needs to change. And so I love obviously the work we're doing at Fair Water, but also some of the other projects, I think actually trying to get more people involved in the citizen science, I think is a great way to try and get people to be to increase people's awareness and get people more actively involved. But fundamentally, when it comes down to consumers products choice and appliance choice and use the end of the day, there's not that many people are willing to compromise on the outcome that they get, whether that come to the laundry, the dishes, etc, they're not willing to compromise on the performance or the convenience, and in order to save water. So that's one of the huge challenges, I think, in this space. And one of the things that we're really excited actually with the consortium that we've got within Fair Water is actually being able to go and tackle that and actually, we've got a range of quite innovative and different solutions, that we want to go and test and trial with people that actually will enable them to not have to compromise and but yet, we'll make a meaningful difference on water. And importantly, we'll also be retrofittable in existing homes wouldn't rely on it having to be a new build.

**Catherine Thompson** 1:36:08

Thank you very much, Fiona. Moving on to our kind of excitement question. Chris, I'm going to put you on the spot. Chris, what are you most excited about from the entries we've heard from today, or your own entry?

**Chris Jones** 1:36:21

I think, well, thinking about our own entry. I think that opportunity to work directly with customers to co-create solutions with them so we understand what they're looking for, as Jess said, what their motivations are and as Fiona said, what their expectations are in terms of how those products work, and the outcomes they get from them, and to test and learn with them so that we're not just dropping solutions onto them assuming that they're going to work, but that we understand perhaps what some of the barriers are, we can address those through the project and do very much that iterative approach that Paul was, was urging us to experiment to try to learn and to revisit and improve things as we go through the project. So I think for me, that's that's probably one of the most exciting things. More broadly, I think it is the partners that we've seen, already presented today is any of the partners we've got in our project is are new to me, I've not worked with them before so that's great. But across the board, I think having that injection of insight, new thinking, and new insights into the water sector is absolutely essential. If we're going to continue to make progress.

**Catherine Thompson** 1:37:39

Thanks very much, Chris. Amina, you've got the balance of working kind of at UU and also at the Rivers Trust. What for you kind of listening to those entries today are you most excited about?

**Amina Aboobakar** 1:37:50

I mean, just echoing what Chris just said, it's the injection of new voices, new approaches new thinking into the industry. And, you know, just working on the other side, as it were for the last year to help develop this proposal have been absolutely fantastic. It helps to, you know, jiggle up the gray cells and look at the problem from a different perspective, we always look at the water industry in a sort of a siloed way. But we know we need to do a lot more with working with other partners. So being on the other side of the fence, as it were, is helped to give me a lot of perspective and to help build the back perspective into this proposal and, you know, we were able to build bridges put something together that brought a lot of buttons and a lot of interest across the industry across other sectors and we know we've got a mammoth of a job to do in the next few years. But it was something that Paul said, because why wouldn't you is we're looking for ideas that people look at and say why wouldn't you? And this was precisely one of them. Why wouldn't you because it's around open sharing transparency of data, and actually building that picture around the baselines and the data's the data that we need to inform our decision making a lot more collaboratively. We certainly and that's what I've learned in the last year with the Rivers Trust. We don't have all the answers in the industry. And these projects are fantastic and going to help to broaden our minds, I think and what a fantastic competition it's been.

**Catherine Thompson** 1:39:24

Fantastic. Thank you so much. It's so interesting to hear those two different perspectives that you've managed to bring together there. I'm going to now ask for any kind of final comments from any of our fantastic speakers in this group of entries. And any final comments?

**Michelle Walker** 1:39:43

Yeah, I mean, I just would like to sort of add to I mean, his point I think what I'm most excited about with this because this is an idea that you know, we consulted over 90 organizations before we put this proposal together. So we know everyone wants this, and I think having the Ofwat, the innovation funding is going to help us to really get this started so that there is one thing that everyone backs and it's co-designed and collaborative, rather than everyone going trying to reinvent the wheel. And that, to me is the really sort of single most exciting thing about this is that we can get this started. And we know that we can bring in so much co-funding to this. There are so many other potential beneficiaries, and partners that we can work with in government and industry to make this sustainable in the long run. So yeah, thank you for the opportunity, really excited to start.

**Ed Barnes** 1:40:33

Just to support that as well, Michelle, it's about two emails this morning already from people saying, we've just seen the bid announcement stuff, amazing. If there's anything we can do to help, just let us know. And it's just that ambition, and really, so many different organizations from inside and outside the sector wanting to come together against these challenges, I just think that's been absolutely fantastic. And it's almost difficult to narrow it down to a group that is sort of enough that you can actually get the project over the line and not so many that there's hundreds of different people involved, trying to get just what's a relatively small project done over the next two and a half years.

**Catherine Thompson** 1:41:10

Cool! Thank you so much to all of our panelists and speakers in this section, we're actually going to go to a brief break. And just to kind of let you all go make a cup of your chosen form of caffeine, and pop to the loo. So I'm going to actually ask you all to be back for 11:30, when we're going to hear from the artificial intelligence of things, enabling waste catchments, and kicking off our final section, and looking about kind of the potential of technology and transformation. So thank you very much. And we'll see you back here at 11:30. And welcome back everybody. And we're going to now kickoff our next section, where we're focusing a bit more on some of the entries that really are pushing the boundaries in terms of new technologies, with a particular focus on artificial intelligence. And so James, I'd invite you to take us away talking about your entry.

**James Ballard** 1:42:05

Brilliant, thank you very much. So hi, all yep. So James Ballard. I'm an innovation architect at Severn Trent. And I'm going to tell you about our entry, artificial intelligence of things. And starting to think about that questionnaire about is it just the technology? And of course no, and I'm going to explain why. So I am going to share the screen. Brilliant. So, um, so yeah, so I'm going to be presenting today on behalf of Severn Trent and our supporting partners from across the water industry, technology, industry and academia. And I do just want to shout out and thank all my colleagues and friends who have helped contribute towards this entry. And a big shout out to Darren Duncan as well, my colleague, who co-wrote the entry with me, so massive thank you to you all. So climate change that is one of the main challenges that the water sector faces over the coming decades. So in 2020, the water sector was responsible for more than 1900 revelations 44 of these classifiers are serious. In the last five years, water companies partnering with us have seen a significant increase in hydraulic facade flooding, and in some cases exceeding 500%. And the Met Office predicts that by 2050, winters will become 30% wetter. So this is a sector-wide challenge and we think the goalposts are moving quicker than we can run. And business as usual is not enough. So we need to drive breakthrough innovation before it's too late. And we believe that the scale of the solution needs to equal the scale of the problem. So to date that the water sector has focused on deploying and trialing point solutions to individual challenges, and these are disaggregated across wastewater catchments. And even with emerging analytical capability, business as usual, today still requires humans to observe, interpret and react. And we can see a significant opportunity here to join the solutions together into a single autonomous catchment management solution that can learn from an optimized individual elements. So what do we plan to do, we want to be brave and bold by bringing together two powerful and innovative concepts in order to create a brain that considers the wastewater function, a true end to end system. So the Internet of Things will provide a digital nervous system, whilst artificial intelligence will provide the brainpower that can make decisions to optimize and tie catchment. And we're going to bring those together to make the artificial intelligence of things. So this concept goes far beyond the human enhancing capability has been developed today. It connects all of the dots by identifying patterns and issues that humans can't see or understand. And then it can make fully autonomous actions. And so we're hoping that we can develop this in order to optimize network storage and calculate the optimal sequence of automate actions to try to become truly productive, but also to reduce future embedded carbon. We also want to stabilize flows that will reduce carbon emissions and increase resource recovery. But perhaps most importantly, we want to be reducing that severe flooding and pollution, which will improve social and environmental wellbeing. And we're really going to focus on bringing that step change to delivering a top socially acceptable service to customers and the environment. So, to bring this solution to life, we formed a delivery team of water companies, industry experts and supporting groups that will come together to develop the game changing brain, carry out and evaluate proof of concept trials in live catchments. And finally, develop the blueprint for scaling and rolling out the, you know, that AIoT across the sector, and each step of the way, we will need to manage one of the key risks of this project, which is going to be cybersecurity. So working with the NCSC and leading cybersecurity experts, we're going to embed this cybersecurity wrapper around everything that we're going to be doing. So, the entry doesn't stop here. Of course, we know that adopting sector-wide innovation at this level is not sustainable without a shift in culture, and the unification of creative minds and passionate people. So we're going to create a shared vision that's going to drive a synchronized and aligned approach throughout the sector. We're going to work together to train educate and change behaviors that build confidence in insight driven automation. And finally, we're going to bring the sector together to encourage knowledge transfer between water companies, regulators, and the supply chain, as well as the standardization of best practice. So we're building collaboration to tackle a sector-wide problem. We want to be brave and bold, we want to combine artificial intelligence with the Internet of Things to join those dots together. And we're going to unite the sector to drive the culture shift that we need for a sustainable future. And we think the potential for fully autonomous waste catchments does exist, we simply need to unlock it. Thank you very much.

**Catherine Thompson** 1:46:48

Thank you very much, James. I now invite Fionn to come and speak about safe smart systems.

**Fionn Boyle** 1:46:58

Everyone. Alright, so I'm Fionn Boyle. I'm from Anglian Water, and I'm happy to humbly represent all of our project partners for the safe smart systems project here today. This project focuses on embedding long term operational resilience to our next generation of water systems. Openness and partnership working are at the heart of our proposal, bringing together water companies from across the UK and globally recognized leaders in smart to develop innovative solutions now and into the future that will deliver value for our customers and for the environment. Imagine a world where resilient systems operate with complete autonomous control, where scalable AI can self-regulate our water systems to eliminate 95% of service issues, such as leakages, interruptions, and pressure issues, and enhance the management of the remainder. Imagine a world where customers’ expectations are constantly exceeded by the services provided by water companies. And our industry is perceived to be enhancing and protecting our environment. A reality check, unfortunately, brings us to a very different world. In face of complex external challenges such as climate change, population growth, and cyber threats along with inherent operational issues such as leakages, we face a serious risk that part of our countries will run out of water within the next 20 years. As a sector, we are perceived to be reactive to be constantly firefighting with limited visibility of the bigger picture. We experienced inconsistent data frameworks and data quality issues resulting in minimal system level integration. And so without transformational innovation driven by the sector, we will severely limit the long-term operational resilience that our customers have and jeopardize the service that we provide to our customers. So how do we reach our imagined world, we will create a water information management landscape, a definitive starting point for data interoperability and data sharing across the water sector whilst adopting a standardized data framework. We will be the first sector to demonstrate and comply with the National Information Management Land Framework as developed by the Center for Digital Built Britain under the National Digital Twin Program to harness its contents of standards, guidance and common resources to improve interoperability across industries. With this crucial foundation of knowledge sharing and data standardization, we can then develop our systems based AI decision engine, which uses artificial intelligence. This self regulating system level solution which will ultimately achieve complete autonomous control is what we describe as an AI decision engine. It will propel us from predominantly reactive modes of operation to transformational proactive interventions across water systems, right from abstraction through to customer and usage. It will learn the consequences of failure relating to performance customer and to the environment to trigger an automated response to achieving up to move operation in that water cycle, using our AI decision engine, we will exceed customer expectations, protect our workforce, and preserve our environment through long term operational resilience. It will take a collaborative effort to realize this imagined world, our partnership delivery model champions this in a live incubator environment. This open by default approach will be the base whereby we can rapidly prototype scale and operationalize the solutions for subsequent nation or nationwide deployment. The benefits of a safe smart system have the potential to completely transform the water sector and to have significant influence on unpaid investment and beyond. By realizing this solution, we will embed long-term operational resilience into our systems and ultimately improve our service to customers and enhance our impact on the environment. Thank you.

**Catherine Thompson** 1:50:59

Thank you very much. James, I welcome you to come back with your video. And also I know that there are some others on the call who are involved in both of your entries so also welcome any of them to turn their videos back on and come join the discussion. So, James and Fionn, both of your entries are seeing some really, really exciting technologies. I think obviously Fionn you kind of brought up the AI decision engine. But what is the one technology you're most excited about trialing in your entry? Fionn do you want to go first?

**Fionn Boyle** 1:51:34

So I think there was a point made earlier. And you know, the question is about technology, but if I was to think about what I'm most excited about this project is not about the technology, I think when it comes to innovation, in the water industry, technology is the easy part. The the element that I'm most excited about is the cultural change and the opportunity to drive different behaviors when it comes to embracing technology in whatever form that comes in. If I was to directly answer your question, Catherine, I think the technology that I'm most excited about, though, is more about the data framework and the ability to create interoperability not just across the water industry, but then to be able to feed that into the national digital twin program and improve our interoperability across industries, you know, open data, and being open is absolutely the heart of what we're trying to drive. And this is going to be a key tool and and being able to make that practical and achievable in the future.

**Catherine Thompson** 1:52:33

Completely agree Fionn there in terms of kind of, you know, technology is always the easy bit, but still pretty exciting. And yeah, some really exciting things there around kind of open data. James?

**James Ballard** 1:52:42

Yes, so I guess for me is around bringing our workforce on a journey with us, so is around that kind of taking our colleagues on that journey to remove dull, dirty and dangerous and changing the way that they can work in order to benefit our customers and society. So it's about creating that transformation, not just in technology, but think about people processes, data and technology, and then working out how to create that kind of blueprint to, as we talked about earlier, combine these things in order to how do we procure them? How do we embed them? How do we work with them, maintain them? And how do we do that in a unified way? So that we're really achieving and unlocking those benefits, but not just doing it in silos? So yeah, both aspects me one is how to how to develop this stuff together in a unified way, and how to bring our colleagues on a journey with us to completely transform the way that they operate today, in order to deliver those benefits.

**Catherine Thompson** 1:53:39

Thank you very much. I'm going to bring you both now on the spot. And is there one technology you think currently is underutilized in the sub sector? And I think potentially, to prove the point, or is that perhaps one that's being over utilized, and then other things could maybe take its place? James, do you want to go first on this one?

**James Ballard** 1:53:59

So again, we're calling out I guess a specific technology and I think if I think back to the starting point for the century, it's all about if you think about if everyone went to solve a problem, that probably go to solve a problem in a slightly different way, using slightly different logic, or a slightly different method. So I guess today we've got things like smartphones, smart technology, everybody can have this kind of block that does smart stuff. But it's how you use that technology. It's how you use that phone. It's how you use that PC controller. So I think I'm more excited about seeing what we can do with the code inside and what new logic we can bring out rather than a technology. So the technology I'm excited about is the controllers, the PCs, the edge processing, the stuff that can harness the brain, but it's what is the brain we're going to create and how are we going to do that? That's exciting to me.

**Catherine Thompson** 1:54:51

Thank you.

**Fionn Boyle** 1:54:53

I think for me, Catherine, if I can move slightly away from the specific technology and talk more about the approach. Working in innovation pretty much all of my career in the water industry. What has always become apparent and can be frustrating, especially as a supply chain is the need for, you know, continuous trials and actually trials with the same technology in multiple different companies and not being able to move beyond that. And that was something we really took in took into consideration as we built this bid. And so our approach is to use an incubator, so one geography to where all of the partners are coming together to explore all of the different solutions in that one area. And to be able to create the opportunity for others to learn from that to do lots of knowledge sharing and bringing people in. But working in a more collaborative way should allow us to only try once, and to prove the concept and mean that others can just follow off the back of that and you know, ultimately save time and see those benefits in.

**Catherine Thompson** 1:55:59

Thank you very much. Finally to wrap up again. Really challenging question for you two. Where would you like to see the water sector in 2050? And I think, focusing particularly on your entries, what is the kind of one thing that you would like to say that you've achieved, looking far in 30 years into the future?

**James Ballard** 1:56:22

Am I taking that one first? Oh, crikey, that's a difficult one. So if we think in less than Mars into future 2050. And so at the very least, what I'd love to, for us to have achieved is that kind of unified blueprint, so that we're all tackling the problem the same way so that we can completely change the game together in a safe manner, especially when you think about the cyber security aspect. I mean, that is changing day to day, that kind of the effects you're seeing in the news how, how cyber hacking is is, you know, becoming quite a big thing. And we need to consider that. So I think at the very least having a unified, safe cyber-secure approach throughout the water industry and the supply chain would be fantastic. Thinking beyond that I'm thinking robots, I'm thinking fully autonomous, little robots that go around fixing everything, and go around completely solving all our problems. And what we're having to do is having to look after our batch of robots, but maybe I've been watching too many films, who knows?

**Fionn Boyle** 1:57:27

I think that's a great response from James, I think, for me, if I was think about where I wanted the water sector to go by 2050. And immediately my mind goes to the awkward big questions and the timeline that's attached to those, I would hope we would have been a long way into achieving those challenges, if not solving them, and I'm sure the work that goes on to this fund will help in that journey. But I think if I want to see where the water sector would be in 2050, I put it in comparison to other sectors, you know, I would hope by 2050, we wouldn't be the set that people think of being as innovative, actually, I think by things like the Ofwat Innovation Fund and the energy, the enthusiasm that we've seen across all of the projects, funded or unfunded at this stage, we will have driven the industry forward and be seen as leading when it comes to innovation be seen as leading when it comes to customer service, and hopefully, you know, built that reputation collectively and collaboratively rather than to competition.

**Catherine Thompson** 1:58:28

Cool, thank you very, very much, both of you. Wonderful finish to the showcase today. I'm now just going to remind you all about what's happening on Monday. So you've heard from all of the fantastic entries today that have been successful in round one of the Water Breakthrough Challenge. As of Monday, we'll be launching round two. So I really hope that you've been inspired by what you've heard today. And we also really hope that you'll be entering or considering entering the next round of the competition. So the Water Breakthrough Challenge in the next round is split into two streams. So we have the Catalyst Stream with £5 million, around £5 million available for entries between £100,000 and £1 million. And if you or any of your partners ever wanted to explore some slightly different intellectual property rights and opportunities, please do check out the details of the kind of new intellectual property rights arrangement on Catalyst, so look out for that one on Monday. We also then have Transform Stream. So we've got approximately £30 million available for Transform for entries between 1 million and 10 million. And again, we're really looking for those ambitious innovation projects that are really going to spark that transformation and hopefully looking at you know, things like adaptation in relation to climate change, looking at how we can work with customers in new ways and potential for new technologies or new approaches kind of that Fionn and James expertly outlined. Entries will be opening on Monday, 11th October. As usual there's a two stage process, Transform will then kind of closed on the 16th for stage one entries, and then we'll reopen for stage two on the 15th. Catalyst will close on the 8th December. So please do get working and look out for that announcement on Monday. If there are any other questions, please do pop them in the chat. But thank you very, very much for joining us today. And hope you have enjoyed the session today as much as I have. Thank you very, very much to all of our speakers, all of our winners, and look forward to speaking to some of the winners this afternoon on our internal onboarding call. Thank you very, very much everybody and speak to you soon.