IWC Winners Showcase Event Transcript

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**Caroline Pradier, Nesta Challenges** 00:05

Okay, we have a good number of participants now. So let's start.

Good morning, everyone and welcome to the showcasing event for the first winners of the innovation in water challenge. We're really excited to welcome everyone today and to hear more from these projects. My name is Caroline Pradier, I'm the Programme Manager at Nesta Challenges, working on the innovation in water challenge. (Next slide, please). So this morning's program, we're going to briefly hear from John Russell at Ofwat who is going to give us a few opening remarks and then we'll have a conversation with three selected judges from the judging panel moderated by Harrier Armstrong from Ofwat and then we'll have a short presentation of the 11 winning entries, which is probably the real the exciting part of the day, because we can finally see what has come out of the of the first challenge so, I'm really looking forward to that part. (Next slide, please). So John, I'm handing over to you. Thank you.

**John Russell, Ofwat** 01:23

Great, thanks. I always like seeing these photos that you have, you know, with people when you know, but they were taken a few years ago and always makes me a little bit sad, how much more I've aged since that one…! And thank you everybody for joining. And it's great to see so many people on this call; I think it shows the level of enthusiasm for the innovation competition, or what we're doing here. We've been absolutely delighted to announce these successful projects from the inaugural IWC competition a couple of weeks ago, and really pleased that we've got this opportunity today, to showcase these projects in more detail, and talk a bit to the judges about the process they went through. And, you know, actually sort of, I suppose, get under the skin of exactly what we are doing here. Because I've constantly say that, you know, the aim of this competition, and what we're trying to do in Ofwat is not just to allocate money to projects, it's to try and catalyze real change in the sector and try to bring a level of stimulation of innovation and help the sector move along, you know, to the next level of its Innovation Development on some of these big existential challenges that it faces and I thought, you know, I hope that you can see from the projects, that one in this first round, that, you know that's been the focus of the judging panel and we were really pleased with exciting caliber, the really high caliber as to the judging panel, which again, shows the level of enthusiasm, and I think some of the pent up demand for this work. And the IWC is, you know, is the very first foray into delivering an innovation competition. And the second part, the second chapter of this adventure starts tomorrow with the launch of the Breakthrough Challenge, so this is the, you know, the bigger chunk of money for this year that we're allocating and, obviously, I really anticipate a strong level of bidding from that; we received 61 entries for the IWC, which really exceeded our expectations, though, to give us a bit of a headache, obviously, in terms of being able to choose that but, I think it was really great to see that every Water Company in England, Wales, and I think Scottish Water was part of the bidding as well, which is great to see we were represented in at least one application, as well as three NAVs. We did do it at a fairly fast clip so, I do appreciate a little bit of pressure but, I think the collective effort for everybody to put bids in and a really strong selected set of bids is really applauded and I really hope we can sustain these levels of interest and enthusiasm as we carry the competitions further, obviously, we couldn't find everything that came through; it's the nature of nature of the competition, we made 2 million pounds available, we had bids that would I think over 10 million pounds in the end and this meant obviously we had some difficult decisions at the assessment level and the judging panels had quite a, you know, real job to do to go through those bids but, I think we've ended up with bits that really do reflect the kind of catalytic change we'd like to see and some of the key themes that we set out for the competition. But, you know, a big broad set of contributors to the beat the winning bids, the 11 winning bids, 14 water companies were involved either as a lead applicant or partner. And one of the bids which we're really excited about is for the Center for Excellence, which is a joint venture across the whole sector to really have a place for developing sort of innovative solutions and sort of catalyzing innovation in the sector, so all companies have a stake in that and I think that's a great indication of the sector coming together on these kinds of issues. I think it's probably also worth saying that it's not the end of the line for those applications that were unsuccessful, as really, we really want to, we're really happy to continue to engage with those bids that weren't successful, this time round, given particularly, it's the first time we've done this, to get feedback from those bidders and asked to provide feedback as to perhaps why they weren't successful this time around. So that they can be considered in subsequent competitions and I think that's sort of an important part for us, that it was not a sort of, you know, a one shot deal. So looking forward, as I've said, our driving motivation for the fund is about catalyzing cultural change and growing the sector's capacity and capability to innovate, and this isn't something we're going to crack overnight, there's obviously an awful lot that's been already going on in the sector, and I think that level of bid showed you how much you know, was already going on. But we are, you know, we really see this as quite a long term journey for us and for Ofwat, and that's the reason we're planning to run the competitions over the rest of this arm. And, you know, we're not waiting for the five years for the dial to shift and we, I think we're already seeing some really strong changes in the way the sector is working with the other companies with people outside in other sectors, with third sector call institutions with academic institutions as well, but we do want to see in the next rounds, water companies, and nav challenged themselves further on the types of projects they consider and the partners they collaborate with, to move further into perhaps some more unconventional collaborations, there may be high risk, but maybe higher reward in the process of what's possible.

**John Russell, Ofwat** 06:55

Clearly, you know, different companies are in different places as well and some, you know, we've got big companies, we’ve got small companies, it's natural to expect that maybe the capacity is different in different parts of the sector, but we do see, you know, what we've done so far is already making a difference in terms of the level of innovation, but as we said, really, I think in the future rounds, it would be great for us to see those less conventional partnerships, going outside of that comfort zone into you know, into spaces that may be adjacent to the water sector may be very different and see what they bring international partnerships, partnerships, different partnerships with other bits of the supply chain. Because I think that's you know, that's where the real sort of frontier of innovation, and will really help to hit the strategic themes that we're focused on. But we've said very much this is a pilot year for the competition, we're learning as we go along and we'll adapt our plans, as you know, in order to get the kind of best outcome for the sector for our customers and we've said, you know, we’re really open to dialogue and hopefully sessions like this, other sessions that being run through our partners with Nesta, and Arup, can really help to tease out what's worked, what maybe needs to be improved in the way that we do this, how we get that really broad spread of innovation and allow, you know, the kind of access to the competition that we really want to see across not just at the water sector, but into other sectors and other places. We've got meetings lined up with you through all sorts of different channels, but we are really open to hearing from you about the competition design, the barriers and what goes forward. So because we want the best results for the fund and for us, this is a big innovation in itself. So we're learning very much. Now we, our intention is to run another IWC this year and possibly also another Breakthrough Challenge as well, this year, before the pilot period comes to the end and then we'll do an evaluation of a more formal evaluation about how that first year has gone before announcing plans for the final three years to fund. So, I hope that this is an informative session. Hope it's inspiring, it's great, it'll be great to hear the detail of the the projects that came through getting some fantastic sort of spark off of the projects that they're in, there's been lots of debate in the press and in our stakeholder groups about, you know, the projects we're seeing coming through and I think it's really helping to drive innovation in the sector and we're seeing, you know, hopefully some of that great leap forward that we will believe is there and is sort of that capacity that's latent in the sector. But hopefully, these sessions are, you know, said really, really interesting, inspire you to put more bids in and you know, we'd really encourage, you know, a good level of bidding again for the future rounds. So thanks so much for this engagement and look forward to a lot more discussion and debate as we go forward about how we really reach the frontier of innovation.

Thank you.

**Caroline Pradier, Nesta Challenges** 10:05

Thank you. (So next slide, please). So for the next part of our event, we've asked a few of the judges from the innovator in water challenge to join us today to discuss their experience and thoughts on the challenge and some of the inspiration they had reviewing the entries. So, you will notice this morning that none of these judges work in the water sector and this was really important for us to hear from them. Just because throughout the judging process, we really saw how important it was and enriching was to have these perspectives from different sectors, and explore linkages and common challenges. And so I'm very happy this morning to have three judges joining. So I'm just going to briefly ask them to introduce themselves. And so if we could start with Myrtle, please.

**Myrtle Dawes, Judge** 10:57

Hello, Hi, everybody. My name is Myrtle Dawes. I'm from OGTC. And the company I work for is a technology center and we're focused on transitioning out oil and gas to net zero. Thank you.

**Caroline Pradier, Nesta Challenges** 11:14

Thank you, Rachel, would you please introduce yourself?

**Rachel Skinner, Chair of Judging Panel** 11:19

Hi, everybody, so I'm Rachel Skinner. I work for WSP and this year, I'm the president of the Institution of Civil Engineers. So I chaired the judging panel for this competition. Very, very enjoyable process. I will say, yes, lots of involvement over the years in innovation, but particularly for a transport side of things. So really interesting to have a look into the world of water.

**Caroline Pradier, Nesta Challenges** 11:40

Thank you, Adam.

**Adam Scorer, Judge** 11:43

Hello, I'm Adam Scorer. I'm an executive at National Injection, we're a fuel poverty and energy efficiency organisation in England, Wales and Northern Ireland, but we have a very strong project around water poverty as well. I think our major focus is recognizing that those warm, flashy human beings that are customers of water companies and other companies have lots of things in common and a bit of innovation that focuses on vulnerable households has lots of benefits not just for water companies, but for other sectors as well.

**Caroline Pradier, Nesta Challenges** 12:19

Thank you. And facilitating this conversation between judges is Harry Armstrong who is the Director of Regulatory Policy at Ofwat. So I’m handing over to you, Harry.

**Harry Armstrong, Ofwat** 12:31

Brilliant, thanks, Caroline. And many thanks to the judges for joining us again today and giving up their time previously to do the judging. So let's kick off and maybe with some initial reflections from the judges, when they were looking through the range of projects that came through and some of the specific ones, what were the types of things that you were particularly excited about? And from the point of view of coming from outside of the water sector, which of the entries do you think kind of have the most opportunities or creating the most opportunities? And should we go to Rachel first, and then Adam, and Matt to get initial reflections?

**Rachel Skinner, Chair of Judging Panel** 13:11

Oh, thanks. Thanks, Harry. I think, for me, the most interesting and I guess, probably the most exciting thing in terms of, you know, getting across a large range of these entries, and really understanding kind of what was in the bucket and what we were going to be choosing from is that there was just, there were so many examples of really creative thinking around real world challenges, and really kind of applying that thinking on the ground, sometimes in a very local way, sometimes in a much more sort of a, you know, regional or even national way. But really getting to grips with some of these really big world challenges within a pretty reasonable funding envelope. But in a way that it felt there could be some real changes and we'll outcomes and we'll things that could then sort of spawn other good thinking that kind of flowed beyond their own individual borders. For me, the most interesting kind of topic, I suppose, and those of you who've heard me speaking already in my ICE role, you won't be surprised to hear this. The most interesting topic was essentially anything that that touched in any way on the issues to do with the climate emergency to do with climate action, whether those were the pieces to do with the circular economy type thinking or to do with resilience or to do with carbon reduction, I think it was really interesting to see how it wasn't just one take on that particular issue. There are so many different things clearly that we need to get to grips with and within the water sector as a whole. It was really exciting, actually, just to see how that thinking has already become so broad in terms of all the different things we need to get across, which is great. And I suppose my kind of final thought on this is that I think we mustn't underestimate the power of these projects in terms of what they really could deliver, not just for this sector, not just for the UK, but certainly for other sectors and other geographies as well in time so yeah, really, really fantastic to be involved.

**Harry Armstrong, Ofwat** 15:02

drums come in

**Adam Scorer, Judge** 15:06

many of the same things as Rachel, I guess what really struck me was being a brown floor of a process. So if I was to say the three things that struck me about one was, I think the process itself created an accelerated partnership, which seems to be at the heart of enabling water companies to think beyond business, as usual. So I think that feels as embryonic. And John was saying with his the first stages of it, and I think that's what gave me huge uhm, because some of the projects are in three different stages of development. So I'm really well articulated, some coming through. But to have that many issues, submitted to that sort of interrogation within companies and through partnerships, I think is a really strong opportunity. The second thing was, especially around a couple of the projects, the opportunity to create a platform, where we learn from innovation. So rather than go from project to project to project and repeat the same opportunities and mistakes, it feels like we're missing the opportunity for an iterative process whereby you go from issue to issue to issue and challenge and challenge building on what we learn with a strong focus on on evaluation to make sure that we don't see these as a challenge fund, but as a cultural process, where we learn from innovation. And I guess the last thing was, in different ranges of the projects is the focus on evaluation and evaluation partner, so not just delivering part. But whether it's kind of academia or consultants or third sector there not much. It was that real focus that evaluation and dissemination is at the heart. And I think that was taken to heart on most of the bids that came through. And I think that's a really positive feature.

**Harry Armstrong, Ofwat** 17:12

And Myrtle just to finish up with your reflections.

**Myrtle Dawes, Judge** 17:15

Yes. So I think just to build on what the other judges have said, I was probably most surprised by the similarity of the topics, too, you know, what we're doing within energy. So you know, we have the stuff around, you know, how we're addressing the climate crisis, we had a big digital input, all the things around how we build data, how we interpret it, how we use it. And also other things like reuse of infrastructure, and leaks, all the standard things, which you would expect to see. So it's really great to see that. And it actually gives us great opportunities in terms of collaboration across sectors. Probably the other thing I wanted to mention is I was actually really pleased to see us also focusing on the innovation process itself. So you wouldn't be surprised because like, I work at Technology Center, and we're really focused on that. But one of the things that we've noticed is even with great innovation, unless we've got the right culture for it to land in, it doesn't land. So having a focus on innovation itself, how we collaborate, how we transform, you know, and how do we make sure that we have a place where we can all get together and talk about how to fail fast and move on and share this, is absolutely amazing. So those are my reflections. Thanks.

**Harry Armstrong, Ofwat** 18:37

Let’s speak to Adams' point about evaluation, which is, all of that is definitely a strong input or something we want to get out of the fund. And I think it'd be good to come back to that in a second. But first, because, you know, as Caroline said, you all come from other sectors, predominantly in terms of the work you do. And that was a really strong theme that came out during the judges discussions was actually how much alignment there were between some of the projects can be in other sectors. And it'd be really useful to hear from you guys, whether you think there was enough collaboration between those sectors within the bids you saw, and maybe if not, what kind of opportunities and how to make the most of the changes for future funds. So who wants anybody can come in here to retrigger the background? Adam Jones coming first?

**Adam Scorer, Judge** 19:28

Yeah, absolutely. So it was a very strong feature, but much more could be done. If I was to characterize some of the really strong bits it was we need to learn what other folks do really well. You know, we need to not reinvent the wheel and do it and that's absolutely great. But what I was really hoping to see and maybe we weren't gonna see it at this first stage, was something much more I don't know, pompous terms, intelligent system integration, about doing actually doing things together, identifying and scaling problems together. And what especially for me, coming from energy, especially when you think of the regional and national footprint of these companies and energy network companies, the same community, same human beings, the same challenges, especially around vulnerability and income. And yet, it's still learning from one another. And I think a really big next step. And maybe we need to do this first, the next big step was about common challenges and common solutions rather than love and shared challenges and solutions that were really important. For me, obviously, a key to that. And a lot of learning that could be done not just managing mother sectors, is really getting much deeper into the sense of individual household, customer, and community benefit. How do you think through that? How do you identify where the benefits of innovation may fall? And then how do you accelerate and deepen that for those households in the greatest vulnerability, I think that's, that's an area where innovation, especially from firms that are primarily driven by engineering challenges, need to do a huge amount more or not just to get trapped in the basics of social return on investment, or monetizing the bill reductions for households, but how it makes people's lives smoother, better and communities more resilient. So lots more to learn. But I think it was a great kind of starting

**Harry Armstrong, Ofwat** 21:47

Splendid. Who would like to come in next on that? Oh, Rachel. Yeah.

**Rachel Skinner, Chair of Judging Panel** 21:55

I can briefly fill in? I'm off mute so, first of all, I would agree completely with everything that Adam was just saying, so I won't say all of that. Again, I think that for me, maybe just a couple of thoughts there. In terms of, clearly there was a huge amount of collaboration that came through in space, no question at all. But it was it was mainly within sector or directly adjacent to sector so I think that absolutely has an opportunity to stretch that more widely and one idea that occurs to me is that now we know which of these projects are going to get some funding, perhaps it'll be worth engaging with the wider infrastructure and engineering community, not with 1000s of people, but with a select few people who might be able to signpost and point in terms of right, if you're going to do this bundle of three or four projects, perhaps it will be worth the conversation over there or over there. And I suspect that actually, it wouldn't be that difficult to sort of build in a little bit of that thinking even now, in order to guide the kind of the first steps of each of these projects as they go through and avoid, as Adam just said, that sort of, you know, learning things twice by mistake two syndrome that might otherwise come through. I guess the other thought, I suppose in terms of, I guess something I would have liked to have seen come through more clearly is that, in some cases, the purpose that the clarity in terms of what exactly is this entry tried to get out. Sometimes it was clear. But more often, it wasn't all that unclear and as judges, I think, in terms of the conversation we had, while we were while we were going through and agreeing which of the which of the various submissions were actually going to get funding, it was very, it became very obvious that those who were able to communicate and express very clearly what they were trying to achieve in a very, very specific way, tended to do better. Other times we were having to interpret and actually between the judging panel, we were finding we're coming up with different interpretations. That's not specific. Of course, this sector is everywhere. But it's that communication challenge, that I think you know, that there's an opportunity there, I suppose to pick that up. And to see what we might do with that. So that as and when these projects deliver, we are completely clear about exactly what has been discovered, shall we say? And what can be shared and so on?

**Harry Armstrong, Ofwat** 24:07

Yeah. Myrtle!

**Myrtle Dawes, Judge** 24:09

Alright, thank you. And so I think for me, amongst some of the sector's, you know, we are dealing with a very similar problem, especially when it's old infrastructure at trying to find data, interpret data, stop leaks, stop things coming into pipes, all systems. So I think, a lot of opportunity to collaborate because even when I look at what we do at OGTC and the solutions that have been bought by the various developers, of which we've had 1000s of people bring these ideas, and I see what we're doing here. You can see if only we could join that didn't fit together, we'd actually have a more of a systems approach to the problem. But of course, you know, that's just something we're learning and that may be something to work on. That's the one thing I would say is if we look at the industries which have this infrastructure, you can see those commonalities. But some of the areas that I think, as an industry we fail to do very well is to reach out to those industries that are doing things really well. So retail actually does some really fantastic stuff with data, pharma does some fantastic stuff with tracking and knowing where everything is, and it feels as if there are some solutions that are sitting there, which are not in the adjacent sectors, maybe in the adjacent adjacent sector, which if we could just go and grab some of those, they would address some of the problems we’ve got?

**Harry Armstrong, Ofwat** 25:39

Yeah, that's really helpful. And, and let's, let's come back to that point about trying to spurn innovation culture, because there's obviously something that's key within, you know, what the overall fund is trying to achieve. And something where we think there are big wins to be had. We've talked a bit about collaboration, and that obviously was one of the fundamental things the IWC was focused on. We've also talked a bit about evaluation. What are the things if you were judging future competition? Would you want to see articulated and I think we framed as ‘innovation enablers’, ways of working? Is there stuff around, you know, making sure it's integrating into the overall business? Is there stuff around, you know, more deeper things around what that collaboration looks like? What are some of the areas that you think really need to be picked up that you didn't necessarily see this time round? Maybe we start with Myrtle this time?

**Myrtle Dawes, Judge** 26:35

Yes. So just quickly, I think, perhaps, as this process matures, you know, we really need to be very clear as to why this is adding to the general capability, in terms of the solutions and the innovation we're trying to, and the problems we're solving. So I did see lots of technology, it's all very exciting, it wasn't really clear whether or not the, the applicant, though had gone and done there horizon scanning of was that at the top of the pile, and certainly, especially for those who are hoping for rapid adoption, the one thing I can say, you can get adoption if you're ahead of the game. But if you're, if you've got a technology, which you're trying to push, which is in the middle of the pack, by the time you're ready, someone will take over. So I certainly would like to make sure everyone's trying their best to learn from the best of what's out there, and then put the rest on top as opposed to this, this solution would be good for this particular problem. And you know, at obtc, we've actually seen technology where we've, we've funded it, and then its shelf life has run out very soon, because someone else has done it. So I think that's important to make sure that the gap that you're addressing is clear and gives you sufficient headroom to run with that. Thank you.

**Harry Armstrong, Ofwat** 28:05

Adam, Rachel, would you like to come in on this, Adam would you like to come in first?

**Adam Scorer, Judge** 28:08

And, yeah, happy to meet there's a number of things that strikes me but I guess the one and the great thing about this, this challenge fund, you know, what it required to bifd was partnership was to engage and collaborate as a way of identifying how you're going to bring innovative solutions to two problems. One of the things the lessons learned comes out one of the questions I hate most is, well, can you tell me which other sectors do things well? That completely stumped me, I can never think of the good practice. But I think there's a lesson about who's able to identify and articulate all the dimensions of a problem that you're trying to solve. So one of the great things about fundamental of communication is about trying to help your interlocutor, explain or articulate the problem in the way in which you can understand, you know, what the problem is or how you can meet the solution. So I would love to see them looking, especially to the third sector, and to local authorities and regional authorities, we have elections tomorrow to try and help them articulate the ways in which the water sector and these bodies can articulate a problem, identify systemic kind of ways of addressing it, and then evaluating it going forward. That's a much deeper level of partnership. One of the experiences and I'm not saying that they do great, but in the energy sector is around the whole netzero decarbonisation of a challenge. It is only possible to frame solutions to those if you have something like local area energy and allow people to be charged heat pumps to go ahead and so you need to work with local agencies to understand how you're going to drive through that problem, the first step there, and it's taken some time to learn, I don't think everyone at once learned, I don't think many people are going to talk is that you need to help those partners express the problem and express the roots the solution in order for them to be really engaged partners in the delivery of those solutions. So one thing I would really like to see across sectors and I use the energy example, because it's the one I know the best, I'm sure it's not. The only or actually the best example is how you take partnership, collaboration to the next stage, not just in terms of, you know, the lead partner, the water company saying we have a problem with bringing in order to be able to select, and actually some of the best bids had that flavor to it had the flavor that it was the company and some of the key partners, explaining in depth and with clarity, what problem you're trying to solve, and what the process of resolution was, was going to be that often, not always that often just ran through as the most clear, sighted, strongest partnership, seeing all the obstacles in the room forward. So learn from other sectors about the depth of partnerships, but not just other commercial network sectors, third sector, local authorities sector, local partnership sectors as well.

**Harry Armstrong, Ofwat** 31:44

Rachel, do you want to come in as well?

**Rachel Skinner, Chair of Judging Panel** 31:46

Yeah, just briefly, I guess I'm just to offer a couple of extra thoughts, I think. I think that the challenge with this is that if we cast around looking at what other sectors did well, yesterday, and the day before and the day before and all the rest of it, we might miss the opportunity to look in a slightly different way out where there are similar challenges where there are similar questions being asked where the focus and effort is today. Because actually, sometimes these things are in innovation. That's it, I always feel it's to do with pace and energy and appetite for change, and so on. So it's a where is there similar effort and focus going on, I mean, that the climate one again, just just jumps out, obviously, is something that, you know, is a natural candidate for this, but so is the post COVID recovery side of things, and all those customer pieces we were just hearing about, it feels that in terms of timing here, there could be a fabulous opportunity, actually, for some of these funded projects to join in and actually support a bigger endeavor. And think about, you know, how, how a particular solution that's been proposed, within this competition could actually offer a build to what others are doing and a little bit like, like Adam was saying, it just feels you know, if we can find a way to mesh him with areas that others are learning and focused on that actually, that cross sector piece might just naturally sort of almost fall in line. But I think it's fair to say if we don't go looking for it, everybody gets carried away the blinkers go on and off, we go down and down the usual channels and, and then we end up in another situation where we say, gosh, we really should look outside the sector and see what everyone else is doing. So no, it does feel that there's a great opportunity to be a little bit more bold, perhaps, than usual with this kind of thing and to to use this, this round of funding, I guess, as an opportunity to just, you know, lift the eye line a little bit and think about that and, and see what comes out. I mean, as Myrtel said, you know, there's a piece around, you know, things don't work out, that's fine. But what have we learned, we've always learned something. So there must be something that comes through all of these ideas. But wouldn't it be fantastic if those ideas then actually did the same build into a wider picture of progress across the whole of infrastructure rather than just within the water space?

**Harry Armstrong, Ofwat** 33:58

Yeah, no, it's come across very strongly in everything you said and I think to that point, as well, about looking forward and not just looking at what's happening now, the sector has, you know, a number of strategies, cross sector strategy documents, and has been working on setting up the challenges and kind of where it is other things happening in other sectors like that so good kind of forward looking proactive engagement is definitely possible on that. And so we're about out of time, almost out of time. The last thing I wanted to ask the judges was some kind of final reflections on whether there were any particular types of projects or changes that were missing from the group that they saw for the IWC. And also just thinking about some of the larger challenges and this being quite a small funding opportunity and what could be done with more funding, what could have been done to take some of these projects or some of the projects like this to the next level, and what would that look like and what would that mean in practice? And so I'll give you two seconds to think about that when I just say a big thank you again to the judges here, and also the other judges on our judging panel for all their help and support, because I think it really helped us pull out the best projects within that group that we got in, which was no easy task as John and Carolyn, were saying with 61 coming in and we hope, you know, in the future that some of these judges might come back for future IWC or breakthrough challenges. And so again, a big thank you to them. And I'll leave you to give final reflections. Let's go. Adam Myrtel, and then Rachel.

**Adam Scorer, Judge** 35:38

Well, I mean, unsurprisingly, even though we had a number of bids, and one good, very good, successful applicant, I mean, the depth of field around your customers, and your vulnerable customer base, and what innovation, because I think this is the big challenge, because a number of sectors that innovation to resolve some of your key engineering, asset challenges are well thought through well established and unable to be articulated, the big challenge is to put yourself in the in the shoes of your vulnerable customer and your vulnerable households and think from their perspective about what you should be doing for them, rather than how you can shift their behavior to be able to make life easier, processor, cheaper, championship, more likely to happen. I think that's a really, really big challenge. I'd love to see more on that. But I also recognize that it's quite a difficult space for companies, especially network companies, in states around the customer bases, not fantastic to be able to do it. So I don't underestimate the challenge for doing it but it's such a big prize. And I would love to see a greater emphasis and some more focus on the future.

**Myrtle Dawes, Judge** 37:03

Okay, thanks. So me next. So I would have said customers? Well, it's already been said. So perhaps the the thing that I think is that even though we had quite a few and very good entries on data, I still think that from a data perspective, this area, this area of how we actually have industry solutions, and hands have the accessibility of data and how we really convert from the unstructured data, and all those techniques, so that we have something to do predictive analytics off, because I think, I think then I think that's missing and certainly across the energy sector, I know that the the energy catapult has been looking at the platforms for data for energy, oil and gas are joining that same thing. So I think there is something there about how we actually join it so that it's not done in pockets, because it's all about it being accessible, sharing slightly different, but it's got to be accessible. And there's some really nice techniques out there so that this can really open up the area of how we then use the data and I think that would be good. I think in terms of the next level. I'm not sure why I thought that the most of the projects were bite size, which I think is really important in terms of innovation, and because you want to be able to fail fast or get some early successes. So I don't think from the perspective of getting to the next level apart from how we articulate the actual proposal so we know what we're actually what it's supposed to do. I think that they were pretty good. Thank you.

**Rachel Skinner, Chair of Judging Panel** 38:45

Okay, so just to just to kind of close this out, I guess in terms of this section, maybe I'm being a little bit cheeky here but I think rather than asking sort of what what more can be done, I think I almost flip it and say, well, actually, the challenge right now is that simply it's about doing the best with what we have got, and delivering on this sort of portfolio, I guess, of ideas and projects that are now in the mix. Because that is surely the best way to prove the process to showcase the range of ideas and that naturally will start to open doors for that next level and will generate interest and that kind of thing. So for me, I mean, coming back to something I said a few minutes ago, it's got to be all around laser focus on the key question, what exactly is each project trying to find out making sure that's 100% clear across these wide teams that have been formed? Making sure we don't get distracted by interesting side channels. It's very tempting, isn't it always to go off on some sort of foray that ends up being you know, very time consuming and not particularly productive? But I guess it's that balancing act, isn't it? It's a real challenge in the early stages of these sorts of projects to spend sufficient time getting organized, forming the team, generating that collaborative atmosphere or that kind of thing, getting that team to work. That obviously is also recognizing that early time is also the moment when the most valuable innovation, sometimes the real bold ideas can actually come through. So getting that bit right and then making sure to say that we really understand what this process has achieved. I think that in itself is the best way to get to that next level that you were referring to.Thanks.

**Harry Armstrong, Ofwat** 40:18

Great. Well, I think some really brilliant advice and considerations from Adam, Myrtle and Rachel, and some key things, you know that the next Breakthrough Challenge is going to be launching tomorrow. So I think a lot of these things, particularly the key message that was hammered through there on being very clear on what the challenges and how your solution is going to have an impact and particularly impact across those five themes that we've identified, is really key to producing a good bid. So definitely think about that, if you're if you're going to be putting in a proposal in future. All of that advice, I think, is great advice. I'll hand back to Carolyn now, who will then introduce the business.

**Caroline Pradier, Nesta Challenges** 41:02

Yes, thank you so much to the four of you for sharing your insights, I thought it was really useful and I really hope it inspires our audience to branch out for future rounds of competitions. I also myself look forward to fostering these links as projects are implemented and as learning is shared during the life of the Fund, so watch this space! We're now ready to hear the presentations from our 11 entries. So the first entry we're going to hear from is AI and Sewer Defects Analysis. So I'll hand it over to either Selwyn or Peter. Thank you.

**Selwyn Rose, United Utilities** 41:42

Thanks, Caroline. I'll kick off and then I'll hand over to Peter. So, morning, everybody, I'm Selwyn, I'm from United Utilities. And our first project that got through was, as it says on the slide, Sewer AI Defect Analysis. So we can go to the actual one-pager please, that'd be probably a bit more useful. So really, the bit I want to touch on is the fact that this one was really about the collaboration piece of work, it was really pleasing to get so many water companies along on the journey with us on this one and to join in on the project because this project will benefit from all of those different companies, the bigger the data set, the better the result is going to be. So having our neighbours and colleagues in Yorkshire and Severn Trent and Welsh Water alongside Thames and Scottish was really important to make this dataset as good as it could possibly be. That was really pleasing to get this one through. There's more to do, but that's really interesting. But we're going to be led on this project by WRC. So another key part of this project was having supply chain partners, and I'm sure everyone on the call knows WRC is aware of them. So it's really good to get a project of theirs through too. And that's a nice segway over to Peter Henley, who's hopefully made it onto Zoom and is going to talk to us a little bit about the project. So, Peter, over to you hopefully. If not, I'll attempt it. But I'll give him 10 seconds to join. I'm sure you’re there, Peter.

**Peter Henley, WRC** 43:02

Sorry, muted. Thank you, Selwyn, yes, Water Research Center, WRC, delighted to be joining with United Utilities on Yorkshire Water and the other water companies to develop this new solution to aid the adoption of AI or machine learning for the recognition, data recognition for defects in the work of sewer condition assessment. WRC worked with the then water authorities to develop the world's first coding structure for the condition assessment of sewers. And that led to the development of the Manual of Sewer Condition Classification. So we're, we're delighted to be, 40 years on, at the forefront now of developing a new solution to aid the adoption of machine learning to recognize and categorize the effects in sewers. Sewer condition assessment is vital to maintain our wastewater networks performance. And sewer condition assessment has relied traditionally on skilled inspectors to identify defects and features in sewers, and this is, I speak from experience, is a time consuming, fairly repetitive job, especially where there's in pipes where there's very little room. So machine learning, or we’ll see real benefits in undertaking this work. The machine learning will be able to be more accurate and more consistently applied and allows the specialists to focus their attention on the more complex issues and to identify new and innovative repair solutions. WRC and the UK water industry are sharing data providing a unique opportunity to develop a wide range of training images to train the software. So the current software is restricted by the images available to train it. So pooling this combined data asset base will enable that to be stretched much wider, and give greater accuracy and more effectiveness. So, yep, so, we see that by doing so will make CCTV of sewers, its condition assessment much more accurate, much more effective, and allow considerable benefits to the network performance, which we see will reduce customer impacts and environmental impacts caused from sewer failures. So we definitely see this as a step forward. So we will be keen to engage with the water companies as a group to collaborate on collection of shared data. But also looking to the current AI software providers to understand how they effectively identify those images and categorize them. But also looking at other sectors. And I think it was touched on by the judges, we’re looking at the rail industry where they do a lot of rail inspection, as to the highways, etc, where they do a lot of road inspection. So there is definitely a crossover there. The challenge is just trying to join, join all the dots, and making a very effective training dataset that will move AI software forward, not just in the UK, but globally, as well, we see this is a real development that we can take forward. Thank you.

**Caroline Pradier, Nesta Challenges** 46:43

Thank you to both of you. We’ll now hear from CatchmentLife. Debbie, if you please take the floor.

**Debbie Wilkinson, South East Water** 46:51

Thanks, Caroline. So I'm Debbie Wilkinson. I'm the Groundwater Manager for South East Water, and I'm just going to present the Catchment Life work which has to do with developing software for managing river species for ecological improvements of our water environments. Next slide, please. So we actually started with a problem that we wanted to resolve. So that problem was the reasons for ecological failures in our water environments tend to be complex, and they're commonly due to integrated pressures. And solutions tend to fix one of those pressures impacting the failure; so that could be water quality or water quantity, but without fully understanding and fixing the other pressures at the same time limits improvements for ecology or WFD [Water Framework Directive] status water bodies. So the aim of catchment life is to develop simple, user-friendly software to assess catchment scale pressures and impacts, but at species level, which is very different to the approaches that are taken at the moment, especially in terms of things like WFD and improvements to water bodies. So intended outcomes are to develop user-friendly decision support software, which will show different sectors or land uses that are causing the impacts and failures. And then look at how we can improve those water environments, particularly looking at the species level, and how we can communicate effectively, so that others can understand those pressures and impacts and what can be done about them. We're going to develop this through a citizen science approach. So helping communities reconnect their behavior to the environment to deliver multiple benefits. Some of those benefits could be realized by our customers in the water industry. So making sure that we invest in the right areas for the environmental improvements. But there's also other benefits to society as well. So with this tool, we can use it to look at improving the habitat of social economic species, so things like brown trout, and also with citizen science approach, using volunteers to help build those skills using computer skills, for example, but then also the benefits for the environment there's long term games. Next slide please. So we've got 10 partners for CatchmentLife. So South East Water is a lead water company, but we've also partnered with Wessex Water, or Sutton and East Surrey Water and Bristol Water. We've also partnered with two universities, University of Huddersfield, and Loughborough University and also the River Restoration Center, who are going to be quite integral to developing the software, but then also making sure that that software is used beyond the life of the project that we've got here. And then Earthwatch Europe, who are going to be key for that citizen science element of the project. And then we've also got the back end of two regulators, so the Environment Agency and Natural Resource Wales. Next slide, please. So how is the project innovative? So the decision support software will be based on bespoke and scientific data models to look at the impacts of species level and what their needs are to help species thrive. We're aiming to do this through a collaborative approach for improvements with the water environments, but also look at buying from multiple sectors. So we're hoping that this tool can bring some of those sectors together to help with blended funding opportunities for improvements. The water industry invests millions in terms of the environment and the water environment, and we're hoping to see different sectors helping with some of that working in future. The project will look at customer engagement. So like I say, involvement, citizen science approach, to not just the use of the tool, but the design as well. And we're going to look at testing it on different types of catchments, so uplands, lowlands, different geologies, just so that it's all gonna be backed up by actual scientific evidence, so hopefully, we can expand out nationally, going forwards. We're also going to look at it not being restricted to current conditions, so using it for what if scenario testing, to look at maybe if there's different pressures or changes in land use in future and what impact does that have on species and also with climate change impacts as well, so that we can look at environment improvements for future generations. Thank you.

**Caroline Pradier, Nesta Challenges** 52:13

Thank you. Next team is around Enabling Whole Life Carbon Design, so handing over to Lindsay and or Mark.

**Lindsay Taylor, Anglian Water** 52:21

Okay. Yeah. Good morning, all, I'm Lindsay Taylor, and I'm Innovation Manager within Anglian Water at One Alliance. Mark, you there?

**Mark Froggatt, Anglian Water** 52:29

Good morning, everybody. My name is Mark Froggatt, I'm Chief Engineer with Anglian Water, and we're really, really pleased to be here presenting this one with everybody because we absolutely crucially believe that this is the very next thing that we need to do and goes a long way to answer some of the really difficult questions. So with that in mind, I'll put you into Lindsay’s safe hands for the next slide.

**Lindsay Taylor, Anglian Water** 52:58

Next slide, please.Thank you. So this Enabling Whole Life Carbon Design project is about delivering the digital tools and associated processes required to facilitate the cultural and behavioral changes necessary to deliver low whole life carbon and cost solutions, and ultimately zero carbon emissions as a water industry. So above all, this project is about enabling the industry to move from purely capital and operational carbon accounting to true whole life carbon cost management, and delivering digital visualization tools that truly put carbon at the heart of both our design and governance decision making processes. Next slide, please. So the project is fittingly split into four phases with the essence that we can stop this project after any phase if we don't feel like we're getting the value that we should be getting. So the first phase will be to build on Anglian Water’s existing carbon database to enable whole life carbon reporting, integrate this with our cost datasets, and then integrate those two datasets within our engineering platforms, or our data rich BIM models. Following this we’ll then create a visual project environment through which we'll use color palettes (so the image on the right hand side isan example of a color palette) to enable carbon and cost hotspotting that will support our design teams and in locking further carbon and cost savings. We’ll then look to embed these visualization tools and data insights into our governance processes to ensure that investment solutions delivered are truly sustainable for our customers, society and the environment. And then finally, we'll look to share the complete methodology and data set templates with the rest of the UK water industry and its wider value chain. Next slide please. Thank you. So as Anglian Water, we’ll be collaborating with a number of partners to deliver this project. Firstly the @One Alliance, which is essentially Anglian Water’s capital delivery entity, so that will provide the incubator environment with which we can try all the new tools and approaches during project delivery and really test their viability. Secondly, Sweco UK and Sweco Group, who have got industry leading expertise in carbon cost management, and have developed sustainability visualization tools for the building sector in the Nordics. Then Skanska, so with their existing expertise in the rail sector, in the UK, in connecting carbon and cost data sets, having them as a partner in this project is going to enable us to expedite their learning from the rail sector onto this project. And then finally, Welsh Water, who will be acting as our critical friend throughout this project, to ensure we remain focused on delivering tools and processes that will work for the whole of the industry. These projects will then be supported by numerous others across the sector. And you can see those below the dotted line. So I'll now hand over to Mark, he's going to talk about why these project’s needed, what's innovative, and what the benefits are. So thank you.

**Mark Froggatt, Anglian Water** 56:10

Thank you, Lindsay. So I think it was really interesting, just before I go into this slide, to listen to the panel members, and they were talking about culture, everybody was mentioning culture. And in fact, if I was asked the three things I would change with this model, the first one would be culture, the second will be culture, and the third will be culture, because it's absolutely essential. We're reaching out to a group, which is effectively focused on delivering solutions. And it's all too easy to deliver solutions as you've always delivered solutions primarily because you've got a known outcome etc. And what we're really trying to do is help steer that group of people and actually get them to make the right decisions for the right reasons. We've been very, very focused on delivering capital and operational carbon. And the thing is now as Lindsay's alluded to, and this is about bringing it together, and giving the larger picture. And the larger picture is, again, as the Infrastructure Carbon Review, way back when they realized that, you know, 50% of the UK carbon, you know, emissions are our industry that actually delivers and builds this, is facing that burning platform. And what we really need to do is get that data out there in a way that it makes it visible to all, and that's the key thing. So if I look through these main points here, I suppose the need is first of all, as an industry, we need this consistent and transparent data set, and that's key, we can't have so many disparate views of this, we really kind of need to have that one point that we can all argue from and to. So what's innovative about this? Well, currently, we don't really have one. So that in itself is going to be a great position to be from. And the benefits, of course, is that true understanding and being able to make the right decision at the right time. And think that's essential about this. And this guiding us now into this next phase of whole life approach is something that is really going to move us to that next phase that we're all striving so hard to get to that net-zero position. So I suppose the next need is the true carbon cost management in the sense of the data sets. And that data set it links into the, I suppose the drive of past 2080, to making sure that this tool gives us what we need in the water industry and enables us then to not just our partners in the industry, as you saw that we've specifically got eight, if you like, a very interested in supportive parties in driving this forward; but I'm thinking out to the wider supply chain for this as well, because the third point, which I'll go on to in a moment, is one that particularly key. But again, moving away from traditional sets and being able to basically visualize, I think the cultural aspect of this is one of change. And one of the best ways that you can initiate change is to actually being able to embrace those and being able to see these intensities and really bringing them out where helps answer those if you like, those questions that everybody really needs to answer. So the last thing I suppose is the need...

**Lindsay Taylor, Anglian Water** 59:43

Either Mark's been cut off or has put himself

**Caroline Pradier, Nesta Challenges** 59:45

Yeah, unfortunately, your project is at time now, given that we only have five minutes per project, we like to run over a little bit.

**Mark Froggatt, Anglian Water**

Oh.

**Caroline Pradier, Nesta Challenges**

Sorry about that. But hopefully people have had the time to read your slides. Thank you. The next project is Industrial Symbiosis. I'm handing over to Rachel.

**Rachel Lombardi,** [**International Synergies**](https://waterinnovation.capsulecrm.com/party/212175525) 1:00:14

Hi, I think Selwyn wanted to kick us off, Selwyn is that..? Or shall I get stuck in?

**Selwyn Rose, United Utilities** 1:00:20

Yeah, I'll kick us off just dead quick. That's fine. Thank you, Rachel. So this is the winner of the catchiest title award, I think, and the hardest to pronounce company name. But if we go to the main slide, please, I think it's just another, just like we did on our other one-pager just to reflect on the partners that are with us. So again, our neighbors and friends and colleagues over at Welsh Water and Severn Trent are with us on this one, which is really good, because, again, the power of this kind of thing is how many people are involved to make it a bigger deal. This is about taking us outside of just day job, water industry stuff and thinking about what happens beyond what we do as water companies and how we engage with other sectors. Really also pleased to have Jacobs with us along the way, because Jacobs has done a lot of work with us at UU on circular economy in the past. And it's good to see that work feeding into something that's a bit more future-focused too. And then, with Rachel and her colleagues at ISL, at International Synergies, it's really good to bring the experts on board and to get us in shape so that we can actually do something with this and know that we're doing the right stuff. So very pleased to have this one through this was a bit of a favourite of ours at UU to try and get over the line. And we're very pleased that we got it there. So Rachel, I'll hand over to you.

**Rachel Lombardi,** [**International Synergies**](https://waterinnovation.capsulecrm.com/party/212175525) 1:01:30

Thank you. So as has been commented, I think a little bit already, in this case, what we've got are proven solutions. And the push now is to get that culture change, as Mark said, the culture change and that frontier of engagement, industrial symbiosis as a concept isn't terribly new anymore. International Synergies pioneered this cross-sector industrial symbiosis approach here in the UK in 2002. And it's continued, since then, at various levels. In the UK, some of you may know us as NIST, we've since replicated that same approach around the world, we've just opened our 40th country, which is Uzbekistan, I'm very thankful for the travel ban at the moment. And so both the process of facilitated industrial symbiosis and the tool of the resource-matching software have been around for some time. And we have lots and lots of existence proofs of opportunities to save money, save resources, save energy through industrial symbiosis. So the challenge that we're addressing is why isn't this mainstream, then why isn't it part of standard operating procedure? And it does, I think go in part to the culture, in part to integrating the necessary changes in perspective and creating the space for innovation that happens when you get diverse parties together. So the bog standard steps to industrial symbiosis are on this slide, identifying and quantifying materials available for reuse, and then opportunities to reuse them, quantifying the benefits from that. And what we're looking to do is managed to get the industry experience and evidence that will more effectively communicate than just having the few existence proofs that we have now. So next slide, please. There's two phases to this. The first one is starting very much within UU. We've done this work in the past for highways, and found quite substantial opportunities just within highways projects. So we expect to find within UU sights and activities. And again, this is important, because it goes to that integration into the mainstream, that integration into standard operating procedure that will take industrial symbiosis and integrate it across business. Again, very much a cross-sector approach. But in this case, now we're anchoring the water sector in the center, and then building up around it. Again, first, starting with connections with UU and then, next click please, adding on the external partners supply chains, and communities. Now, I said that industrial symbiosis has been around for a long time. It's been in European policy for quite some time, and has actually recently been written into the Industrial Decarbonisation Strategy here, although I will tell you that we're going to show them that we don't need a timeline of waiting until 2025 or 2030 to get this stuff implemented and having major impact here in the UK, we're going to show them that that's going to be eminently possible, substantially sooner than that. So the goal is to deliver those impacts, but also, again, prepare the communication that will take us from “Well, yes, it's been done a few times” to “It's now part of business as usual”. Thank you.

**Caroline Pradier, Nesta Challenges** 1:04:59

Great. Thanks. The next project is Leak Detection Using Dark Fiber. Kieran, the floor is yours.

**Keiron Maher, Severn Trent Water** 1:05:09

Okay, thank you everyone.. So the Hafren Dyfrdwy leading this project working with Focus Sensing and Costain, they’re very much the sort of engine behind the project with support from Welsh Water and Portsmouth Water. Moving on to the next slide, we've got a little bit of background. So we all know leakage is important. It's not just a number, it's dealing with supply demand deficit. And the ecological impact of climate change and lack of water in the network is moving us to a point where we're having to drive down leakage to smaller and smaller leaks. And that was easy to find someone over on the right hand side sprouting out the ground. But even when we're dealing with those smaller leaks, it’s harder to detect materials so plastics don't transmit the leak noise very well, leaks do grow. And it causes massive impact on our customers, loss of supply, discoloration, flooding, etc. So as an industry, we've been getting interested in deak detection using fiber optics. And it's a really promising area, it gives you benefits, like 24/7 monitoring, accurate location of leaks, and it can also tell you stuff about activity on the network. So you can get a bit of network activity monitoring use of hydrants, etc. However, the cost of the equipment is prohibitive, a unit that will do 40 kilometers of pipe will cost you a quarter of a million pounds. It doesn't fit into any roadside infrastructure. And to get it into the pipe is incredibly expensive and disruptive. And if you're going to put it on top of the pipe, you're relying on the speed of deployment limited by your pipe renewal, because you're doing open cut. So this is really stopping the water industry embracing this technology. If we move on to the next slide, we've got a bit of background to what we're trying to do. So essentially, what we're trying to use the existing fiber network that exists out there to monitor leakage and develop a new business offering, a leakage-as-a-service business model. The picture of the telephone box, you don't see many of those anymore, but you do see lots of broadband kiosks. And there are lots of fiber around for things like telecoms, on traffic signs, and all sorts. It's very, very ubiquitous, and closely maps lots of the UK’s water infrastructure. So we needed two enablers: one was the network which is already there, but also a market-ready fiber monitor that can go in the existing telecoms infrastructure. And if that's there, we've got this opportunity to use the infrastructure from other sectors, we've got the ability to detect leaks by noise, but also additional information, we've as an industry got very interested in picking up the sounds of leaks from within pipes. Actually, if you take a step out of a paradigm shift and listen from outside the pipe, you get another opportunity, you can start to understand ground stability and the development of voids, which if you have a void around a leak, it becomes a lot more important because you can get cast disappearing into a hole in the road that you didn't know was there. And it also gives us the ability to pick up more network activity. More importantly, this data-as-a-service business model. On the next slide a little bit about the project partners. So Focus Sensors are a technology startup, and they've got this brilliant piece of cake called the Indus, which we're hoping is going to solve the problem for us. And most importantly, from the rail sector, the work they've done there, they've bought information about ground stability, which we're hoping Costain are going to help us to scale this, in terms of being able to deploy the equipment, maintain it once it's there, and help to do all those things that a small startup can't do in the field. And water companies will bring in knowledge of leak detection in using traditional methods, but also a bit of experience in fiber leak detection, which is key to also get the service at the right price point and the right level of accuracy for us. So the innovation element in this, what we're trying to do is we need to understand the coverage of the network and calibrate, how do you calibrate the fiber to make sure you are detecting leaks properly. Understand how we are going to detect the silent leaks using grants stability; the couple of graphs there show how it's been done in the rail sector: they've been able to pick up waterlogging which is key for leaks, but also things like detection of voids where they've picked up issues with ballast in train tracks. The innovation as well, what can we do in terms of monitoring networks, hydro usage, valve usage, things like that, perhaps people digging around our pipes that might cause damage. And the innovation is going to be potential for no capex opportunity for the water industry, no battery replacements, and sharing the cost with all the users who might want to buy the data in terms of what's happening with traffic movements along the areas. So very quick run through, I think I'm out of time. So there's less questions, any questions, which you'd probably not have much time for. Thank you.

**Caroline Pradier, Nesta Challenges** 1:10:27

Thank you. The next project is Organics Ammonia Recovery. Andrew, the floor is yours.

**Andrew Moore, Northumbrian Water** 1:10:36

Morning all, I'm Andrew Moore from Northumbrian Water. I'm responsible for wastewater resource research. My background is equally commercial and technical and I'm leading our ammonia recovery project. The team's absolutely delighted to have received this recognition in the form of the funding, and I'm looking forward to getting on with delivery. Can you click through the next couple of slides please, Laura, and the next please? Right. So what it is that we're going to do and what we are hoping to achieve. Put simply, we're going to recover ammonia from wastewater and turn it into a green fuel hydrogen in this case. Ammonia is ever present in wastewater from our domestic customers, and also some of our industrial customers, and we'll strip it out. Normally, it's quite low concentration in the influent to a treatment works. But at our largest treatment works where we have anaerobic digestion, the ammonia is naturally concentrated in the aqueous flow, coming from the anaerobic digestion, and it's that point where we use our stripping plant. Now, ammonia is a valuable resource. In our case, we're making green hydrogen, but equally, it could be used to make fertilizer or as a simple energy store. And we're going to do this by building a demonstrating and working pilot plant, Houghton, which is a large treatment works on the River Tyne, in Newcastle. So obviously, that demonstration plant will be available for people to see whilst we have it operating. By building the plant, it will help us achieve zero emissions in respect of carbon. And the reason it will do this is because we hope that the energy balance for stripping ammonia is considerably better than the energy balance for treating ammonia, whilst, obviously, it will improve the ecological status of the river by removing proportion of the nutrient that's currently flowing into it. And showing that we can not only treat waste, but also recover its value. The next slide, please, Laura. This is a very simple image, we're going to put a small version of the item on the left, roughly where I've labeled the site on the right so you can get an idea of the scale of things. Next slide, please, Laura, so and again. So we're going to be working with the organics group who are a UK based process contractor who specialize in making things greener and cleaner. They're going to be providing us with the pilot plant, operating that pilot plant, but also I think very significantly, putting in a considerable body of co-funding to our project. So there's leverage to Ofwat’s funding of our project on top. We’ll be working with Warwick University, fine establishment, and their specialism in our project will be the catalyst. They'll be receiving the purified ammonia and splitting that into hydrogen. We'll be working with Cranfield University, who have a huge research base in making use of ammonia have also, I think, been working with quite a number of us water companies in this area. They'll be overseeing the data and the output of the project. And we'll be working with the Wood Group who are the existing process consultants on the Houghton site. As anybody who runs a large wastewater treatment site knows that they never stand still. And so integrating what is quite a significant new process unit into the site will be rather difficult. And the word group is ideally suited to helping us with that task. Next slide, please, Laura. And again, right. Mostly, when the water industry undertakes more wastewater treatment, both the industry's costs and carbon emissions go up. It's a trend that needs to change. So we believe that recovery rather than just treatment offers the innovative solution. As an industry, we render harmless those pollutants which we receive. What we intend to do is not only render them harmless, but also render them valuable. This is the first time this technology has been used at this scale in the UK water industry and for ammonia recovery. This scale we know has been used on leech eight (?), but not within the UK. And we hope this support will allow us to be amongst the first to enter the new market for both green ammonia and hydrogen, and bring technical certainty to an exciting new technology. Thank you very much.

**Caroline Pradier, Nesta Challenges** 1:16:29

Thank you. And we're now going to hear from Reservoir water community monitoring for algal associated risk assessment. It’s a bit of a mouthful, I have to confess. Paul or Rupert, the floor is yours.

**Paul Gaskin, Welsh Water** 1:16:47

Yeah, thank you very much. Hi, I'm Paul Gaskin. I'm Research and Innovation Manager for Welsh Water. We win the prize for the longest title hence why I'm going to refer to it as the eDNA project. Next slide, please. Okay, so what's the problem? Taste and odour events deriving from Geosmin and 2-MIB are becoming more prevalent. These compounds are released by cyanobacteria during rapid growth or when they're stressed. And we're seeing that more and more of these issues in the west and north due to climate change. There's a picture on the right hand side, I put that in to annoy Rupert, that's of a blue green algal bloom. But interestingly, we don't usually see blooms associated with the Geosmin and 2-MIB. The cyanobacteria are usually in the benthic layer or cling to rocks, and can be some way from the reservoir intake as well. So it's a bit difficult to predict, which is why we're looking at this project. So I'll hand over to Dr Rupert Perkins from the school of Earth and Environmental Sciences at Cardiff University for the next slide.

**Dr Rupert Perkins, Cardiff University** 1:18:08

Thanks, Paul. And thanks for pointing out it isn't algal bloom related, my personal bug. So mindful of the time limit, so I'm gonna whiz through this quite quickly. But we've been working with the water industry quite closely, myself and Peter Kill who's also on the panel. And we've got, you know, a far better understanding of some of the triggers and the interaction of those triggers with environmental variables, regarding taste and odor events. The missing piece in the jigsaw, if you like, is near real time live data streams for predictive risk assessment of T&O events. And at the moment, if you're looking at the community of algae that are actually in the reservoir, for example, and using microscopy, that is a snapshot basically, which is time consuming, expensive, and also limited value, because you can look down a microscope and see a species but that species may or may not be a T&O metabolite producer, because some species have different strains of producers or not. So what we're doing is, in this project, is basically switching to using eDNA. So the device on the right is a long read third generation sequencer, just to get even more long words into this talk. It's a nanopore device in this case, and what we're going to be doing is using eDNA to look at these species present and determining if they are actually producers of Geosmin and 2-MIB metabolites. Next slide please. So, this is basically integrating the eDNA data into our other understanding of the metadata from water quality and environmental data to understand how we can use the community present in the reservoir and the problem species in the reservoir to determine T&O risk and predict that T&O risk for treatment optimisation and also intervention management. What we know from our data so far is that it's, you can understand a lot about the T&O risk from understanding the community, not just the presence of the actual producers, hence the fact it's not bloom associated. And importantly, in phase two of this project, is the knowledge and technology transfer phase. So, eDNA technology is cheap and quick, and what we want to do is develop it in a way that we can hand it over to the water company for in-house use, and the ability to interpret the data to determine site-specific T&O risk levels. So that's the overview of the project. So back to you, Paul.

**Paul Gaskin, Welsh Water** 1:20:41

Okay, next slide, please. So, who's doing what. Method development, risk interpretation and technology transfer is down to Cardiff University. So Rupert, working in the School of Earth and Environmental Sciences, and Peter Kill, who's in the School of Biosciences, will be doing that work, ably assisted by David Crowell, who is our project manager to keep us on track. In terms of sampling, Yorkshire Water, Bristol Water and ourselves will be taking the samples. And then in the steering group, there's Welsh Water, Bristol Water, Yorkshire Water, Cardiff University and also we're joined by United Utilities to add their expertise. Next slide. So what's innovative, obviously, we're going to advance reservoir sampling protocols so we understand risk better. We'll be transferring skills from Cardiff University out to the lab so they understand how to analyze eDNA, etc. Establish data analysis skills. So I've said so we can analyze things better, and then the data transfer bit, which is essential really, so we can land this and take it forward. And that's it. Thank you very much.

**Caroline Pradier, Nesta Challenges** 1:22:14

Thank you. The next project is the Seagrass Seeds of Recovery. Claire or Richard, you’re up.

**Claire Beloe, Affinity Water** 1:22:24

Hello, everyone. My name is Claire Beloe and I'm the Climate Change & Carbon Manager for Affinity Water. And we're delighted to have been successful in the Innovation in Water Challenge with the Seagrass Seeds of Recovery project. So our lead delivery partner is Project Seagrass, and Dr Richard Lilley, the CEO and co-founder of Project Seagrass, is joining me in presenting to you today. Next slide please. And the next one, please. Thank you. So this project is called Seagrass Seeds of Recovery, and will provide a blueprint for upscaling the restoration of seagrass to enhance the resilience of the coastal waters of the Affinity Water and Anglian Water supply regions in Essex and Suffolk. As we enter the UN decade on ecosystem restoration, nature based solutions have become recognized as key to addressing the problems of both a nature crisis and the climate emergency. Seagrass meadows enhance the stability of the coastal zone, locking carbon into the seabed at a rapid rate, and improving water quality and creating habitat for hundreds of thousands of small animals. The project will deliver a highly innovative demonstration of a seagrass nursery to facilitate future scale up and a blueprint for a marine carbon financing framework similar to that of the established woodland carbon code. Ultimately, the restoration of seagrass will help to support the UK government's 25-year environment plan. So I'll now hand over to Dr Richard Lilley from Project Seagrass to explain more of the project aims and outcomes.

**Dr Richard Lilley, Project Seagrass** 1:23:57

Thank you, Claire. Next slide please. So I guess the aim here or the overarching aim is to provide a blueprint for seagrass restoration that could be applied by other water companies or by wider industries or interested parties within the UK more generally. The bid sits firmly in that nature based solutions elements. So the UN defines really three big global problems: pollution, climate change, and biodiversity loss. And restoring habitats addresses all three of these. In terms of the specific aims of the project, the outcomes are a seagrass nursery model. Now a seagrass nursery is very much like a tree nursery on land except for it's designed for marine environments, it’s innovation in itself. There is one existing in Australia at the moment, and they're exploring the option in the States as well. But for the UK or for Europe, this should be the first seagrass nursery of its kind. Now to really scale up seagrass restoration, we need to bring in finance and there's a lot of conversation at the moment around blue carbon and so that there is no established carbon crediting framework for the marine environments like there is on land. And so this is what we're going to explore with Oxford University. On the ground, we're looking to look at site identification in Essex and the wider estuaries down there, doing baseline assessments to look at the health improvements we've made over time, then doing some restoration trials. We're also looking to explore some innovative circular economy opportunities, perhaps looking at how we can use dredged oil to create habitat, and how we can use industry process emissions, carbon dioxide specifically, to help enhance seagrass growth in our nurseries. I think it's timely because it's at the start of the UN decade of ecosystem restoration. So we're getting on the ground floor there. It’s authentic because it's with the water industry, the waters industry is all about water quality, and seagrass needs good water quality so there's some key synergies there. It's scalable, because it's something that we can take from this pilot project to see if we can roll out for the benefit of the wider UK. It's appropriate because it's innovation grants and we're looking to make big changes. And it's purposeful, so not only does seagrass restoration capture carbon, but it has that social purpose of enhancing the environment in which we live. Next slide please.

**Claire Beloe, Affinity Water** 1:26:20

Okay, so a consortium of 10 partner organizations has been created for this project. We, Affinity Water, are leading, working with Anglian Water who are the wastewater company for the area. Project Seagrass is the main delivery partner and we will be advised by Natural England, Cefas and the Environment Agency. Salix River and Wetland Services will be involved in delivering the nursery and the Nature-Based Solutions Initiative at Wadham College, Oxford University will be leading the development of the blue carbon financing framework. Swansea and Essex Universities will be involved in researching aspects of the project. I’ll now hand back to Richard to discuss the innovative nature of the project.

**Dr Richard Lilley, Project Seagrass** 1:27:02

So five key things here, seagrass restoration is innovative in and of itself. We have only started doing this at any scale in 2019. So we've still got a lot to learn. The development of the seagrass nursery is going to be world-leading, it will be certainly the first for the UK. And so that will allow us to scale. Carbon offsets for blue carbon will be a new opportunity for the UK, there exists accredited options in woodland and peatlands but certainly nothing in the marine environment just yet. Creating habitats from dredge sediment will be a UK first. And also seagrass growth enhancement from process submissions will be a UK first. So plenty of innovations there. Thank you very much.

**Caroline Pradier, Nesta Challenges** 1:27:41

Thank you. We can now go to the next project. So Smarter tanks to build a resilient network. So Mumin and Peter, up to you.

**Mumin Islam, Affinity Water** 1:27:53

Cool, thank you, Caroline. Good morning, everyone. My name is Mumin Islam, I’m Water Resources Planning Manager at Affinity Water, I’ve also got Peter on the call as well from University of Exeter. I'll handover to him shortly afterwards as well. If you can go to the next slide, please. Thank you. Okay, so our project. So just a quick overview on what the project’s about. So this is the first time for Affinity Water and indeed the industry, where we will be exploring application of real time control technologies on decentralized assets. And what I mean by that is tanks or water storage tanks, essentially, not within companies’ control. So feeding tower blocks, rainwater harvesting tanks. And what we'll be exploring is optimized control strategies for real time to help control for two use cases. So your standard drinking water tank and a rainwater storage tank. And just to put it into context, so imagine, you know, tomorrow morning, really high demand peak draw, you know, if we can control that asset in a way where you can let it draw down a bit more than usual. So the status quo is, you know, always full, stay full total control, it might give that extra flexibility. So essentially giving our controllers greater flexibility, integrating with our own companies control philosophy to almost double or increase our capacity in terms of reservoir storage. So that's what the project is looking at. And the key thing with the project will be to develop what we call this business model canvas, essentially a template laying down the groundwork for other companies and providers to adopt this concept of value if the value is identified through successful proof of concept installation. And the goal was really to develop that technology demonstration towards the higher Technology Readiness levels as well. So if I can pass it over to Peter, next slide, please.

**Peter Melville Shreeve, University of Exeter** 1:29:47

Good morning, everyone. So I'm Pete and I work at the University of Exeter, where our team’s currently raising a flock of entrepreneurially minded engineers at a rate of around 200 every year. And so, top left here, we've got the business model canvas so we use this with all of our students, but also our startup mentoring as a kind of a standard tool to focus on the most strategically important elements of a project. So we're hoping that by the end of this project that we're able to nail down a clear value proposition that we can then share with industry and allow other partners and players to take this forward, if there's value. We also plan to look at the holistic benefits of retrofitting real time control systems. And we're going to be sharing best practices at the end of the project. Part of it is going to be about piloting this solution at a couple of individual locations that we've identified, but we're looking at this systems approach. So we're going to be taking that pilot data and use it to demonstrate how this can be used on a more systematic scale, if we could jump to the next slide, please. So what are we actually doing that's innovative, well, Mumin asked me as the academic to go and explore some research. So I set off my four year old to have a look in his Richard Scarry book. And he showed me this alarm system from the 1960s, that the Americans used to keep an eye on their fire risk. So obviously, we're not going to use 1960s technology, we're going to be using the kind of more industrial 4.0 Internet of Things technologies, in order to monitor and control these assets. So it's a technology led solution, we know that the technology is available to do this, but it's a big opportunity. So Affinity have estimated that they've got around 60,000 assets in the form of small potable water tanks in their catchment alone. So there could be up to a million of these assets nationwide, just jumped to the next element of the slide. And keep running through this one, please. And so essentially, can we drain these down at moments of high demand and top them up again when there's capacity in the network? If it's okay, I'd like to pass back to Mumin for partners.

**Mumin Islam, Affinity Water** 1:31:53

Yep. Excellent, thank you. So we've got a really good range of partners, I would say, good breadth of experience, and specialism of the roles. So as I mentioned, Affinity will take Aqua Civils as a delivery partner. And then DAFNI, Z-Tech and Impact Lab. So really good range of partners. And the last slide and I know we're running out of time. Thank you. So just really thank you, everyone. And here's our contact details. If you want to get in touch really very much welcome to input. And yeah, I look forward to delivering the project. Thank you.

**Caroline Pradier, Nesta Challenges** 1:32:28

Thank you. The next project is Supporting customers in vulnerable circumstances. Sorry, Yatin the floor is yours.

**Yatin Dattani, Severn Trent Water** 1:32:37

Thank you, Caroline. Morning all I'm Yatin Dattani from Severn Trent Water. We're really pleased that this one's had your support. So it was one that we were really keen on as well. So really pleased. So to better anticipate the customer support that's needed, particularly during operational incidents. This project aims to carry out behavioral science driven influencing to improve engagement with communities and how to reach customers who are in vulnerable circumstances. So can we have the next slide, please. Thank you. So the Wordle on this slide depicts some of the challenges this project looks to address and outcomes it looks to achieve. Some of you may recall that during the recent extreme weather events like the Beast from the East, the hot summer we had in 2018 and the numerous storm events we've had to tackle as a sector. We received some criticism, let's call it feedback, around the provision of support to customers who are in vulnerable circumstances at the time. Additionally, CCW’s research tells us that awareness in some communities of the support that is available is quite low. All of this highlights the need to improve our understanding of and our response to customer vulnerability. So we felt that without gaining adequate insight of vulnerable customer needs, the sector risks not delivering the right level of support during planned and unplanned events. This is quite often complicated further by a number of overlapping barriers, which include English not being the first language, and it makes such customers harder to reach, resulting in distant, ineffective relationships with these customer groups. So we could probably draw some parallels actually here with the COVID-19 vaccination programme. So the evidence we've got from that suggests that there is a need to understand the engagement and communication requirements of diverse communities to ensure messages are received, understood, and acted upon. So you know, that we've seen with the vaccinations, people wanting to take it, there are a lot of people who are averse to taking the vaccination. So it's understanding those behaviors. So we propose to do a deep dive pilot in Leicester, selected for its demographic diversity, to understand how customers in our communities communicate. So use of technologies, do they use community hubs, other social establishments, because it really isn't a one size fits all, it really isn’t a put an app out there, and people will use it. Because again, language is just one barrier, there are lots of others. We also need to understand the daily lives of people within the communities that we serve, because we don't do that really often enough. And what we intend to do is with the pilot facilitate an improvement in insight of those that are vulnerable, or close to becoming vulnerable. And through behavioral science and design thinking techniques, we would like to determine what the relationships are between the types of engagement and comms methods and their effectiveness. The insight we’ll get and improving engagement and understanding of customer circumstances that will result from this project would enable development of strategies to improve customer care journeys. So that in turn will put water and wastewater companies in a better position to support vulnerable customers during planned and unplanned events. But also, it will put customers and their support networks in a better position to access the support that is available to them, of which they are not aware. Next slide, please. Thank you. So who's involved, we will be collaborating with a number of organizations. Project partners are CCW, Thames Water, and South East Water. United Utilities, also supporting, as are Octopus Energy who have offered their support. As Adam alluded to at the beginning, focus on vulnerable customers is a cross sector endeavor. So jointly hopefully we'll be able to use our collective experience and expertise to deliver the project. And the next slide, please. So what's innovative about it? Well, companies in the sector are already undertaking a number of activities, for example, in support of increasing PSR reach, engaging with customers from a debt management perspective to offer support. But there is a real need to expand on this to include customers impacted by operational incidents, whether that be water related or waste. So the sector has not previously conducted a deep dive analysis into communities that it serves and understand the needs and to re-engage them as a trusted source of information and support. We'll be using ethnographic principles, again something that's not been done before, to understand the target audience and cultures and gain real insights into the support they may require. This will involve conducting research trials, encouraging choices in line with individual circumstances to determine how the right campaigns can be driven under which circumstance with which category of customers through what interventions and use of which technology is and approaches to improve the level of engagement with customers and communities. To design the best possible solutions, we need to empathize with the target audience. To understand their daily lives, we're going to need to focus on their touch points in the community as I alluded to earlier, and support networks, who they might lean on for sage advice and why services that they currently access and how do they access our services, whether they be public or private, their financial behaviors, how their vulnerability might impact their preferred methods of communication and how we might create pain points that we may otherwise not have. So you know, mobility and obviously language and lots of others. And finally, whether their vulnerabilities is transient or permanent in nature. So, in the end, putting ourselves in a customer's shoes, to understand the barriers within our current approaches, and disseminating the learnings across the sector is a step change in approach for the sector. And given the broad spectrum of customer vulnerabilities that there are - the cultures, the regions - findings from this project can be built upon. And we can hone in on specific areas like different social groups and vulnerability categories across our regions. And so we see this endeavor, this project, as our first foray.

**Caroline Pradier, Nesta Challenges** 1:39:31

Thank you. And now the last project for this morning, the UK Water Sector Innovation Centre of Excellence. Elin, the floor is yours.

**Elin Williamson, Southern Water** 1:39:43

Thank you, Caroline. Hi, I'm Elin Williamson. I'm Innovation Manager at Southern Water and I'm here on behalf of the Innovation Leads across the UK water sector. I can say as well we're delighted to have been awarded funding for the UK Water Innovation Centre of Excellence. And I'm going to give you a little snapshot tour of what we're hoping it's all about. Next slide, please. So what is the Centre of Excellence? It will be a virtual innovation accelerator hub that will encourage diverse collaboration, aiming to transform the innovative output of the UK water sector. It is a key output from the UK 2050 Water Innovation Strategy that we work together as a collective partnership last year and you can download that from the website that you saw at the start there, we'll share that again later, if you haven't already seen it. And the vision for this is to create open collaboration opportunities across the water sector to drive transformational change through innovation that delivers greater value for customers and the environment. Next slide, please. So the partners in this project, as I mentioned, are all the water companies across the nation, plus Water UK and UKWIR, the UK Water Industry Research Organisation. We've worked collectively on this proposal, and we're all committed to making the project a success. Next slide, please. So what are the objectives of the UK Water Industry Center of Excellence? So first of all, it's to enable effective delivery and implementation of end-to-end innovation. Most importantly, at the right pace. It's to improve access to the much needed skills and resources that are there to deliver innovation. And to increase the visibility and transparency of innovation needs, opportunities and priorities. It’s to facilitate collaboration, removing the duplication, which we all talk about that exists within the UK water sector, and increase knowledge sharing, and also to provide a focal point for water innovation to attract global talent and investment. Next slide, please. So this is a bit of a busy slide. But the idea here is to see that the ambition for the Centre of Excellence goes beyond this initial setup period. The core functionality that will be established through the initial funded activity is the top four that you can see there in the light grey. So that's the proposals portal, which is to provide simple access to all and it'll be a virtual proposals portal, which will allow innovators and businesses to submit their ideas and solutions to sector and cross sector challenges in one place. It will have innovation opportunities and need statements. And this is to increase transparency of innovation and to improve the understanding of water sector innovation for all to see. It will have an integrated function, developing an open approach to innovation through active facilitation and brokerage of collaboration across all stakeholders. This is the same to be like in and out of the sector, from funders, academia and other entities all seeking to access the water sector. It will be a place for collaboration groups and communities of practice, to enhance diverse collaboration and knowledge sharing. The really important thing here is it's not to duplicate what already exists. It's to access and integrate existing water sector entities that focus on collaboration, research and innovation. So bringing together the best of the technical research communities in the sector. Most importantly, the Centre of Excellence will promote a culture of innovation. So being a virtual hub, it'll have access to skills and training, promoting diversity of thought through openness and collaboration, providing opportunities for community outreach and engagement, and provide virtual access to the water sector from all innovators. So really, it's all about being like open to all. Next slide, please. The initial setup period of the Centre of Excellence, focusing on those four key functionalities mentioned, will be incubated and developed within UKWIR, the UK Water Industry Research Organisation. The approach is to develop a minimum viable product, taking the agile approach to build and test and learn and adapt in response to what we see the sector innovation needs really are. If you'd like to get in touch directly, you can contact Steve Kaye at UKWIR in the interim until we've got the point person available. And you can watch out for updates on the Water Innovation 2050 LinkedIn page. Next slide, please. And just want to say, speaking on behalf of all of us who have been involved in this, and we're really excited about this project and the ambition of the UK Water Industry Centre of Excellence. So thank you.

**Caroline Pradier, Nesta Challenges** 1:44:47

Thank you. And I think seeing this project bringing everyone together is a good way to end the morning. So we're now at time. Thank you everyone for attending our Showcase Event. Really hope it was an informative morning. Thank you as well to all the people who presented, our winning projects, our judges and our colleagues at Ofwat. I really look forward to see what these projects, you know turn out to be and what kind of impact they have. And it's a really exciting time. And if you have any questions for Nesta Challenges or anyone else involved this morning, then please send us an email at waterinnovation@nesta.org.uk and we'll get back to you as soon as we can. We're just going to have a short poll at the end of this event, which is two questions so please fill it in. And otherwise, I will leave you to the rest of the day. Thank you everyone. Have a good rest of your day.

# LIST OF SPEAKERS (in alphabetical order)

Harry Armstrong, Ofwat

Claire Beloe, Affinity Water

Yatin Dattani, Severn Trent Water

Myrtle Dawes, Judge

Mark Froggatt, Anglian Water

Paul Gaskin, Welsh Water

Peter Henley, WRC

Mumin Islam, Affinity Water

Dr Richard Lilley, Project Seagrass

Rachel Lombardi, International Synergies

Keiron Maher, Severn Trent Water

Peter Melville Shreeve, University of Exeter

Andrew Moore, Northumbrian Water

Dr Rupert Perkins, Cardiff University

Caroline Pradier, Nesta Challenges

Selwyn Rose, United Utilities

John Russell, Ofwat

Adam Scorer, Judge,

Rachel Skinner, Chair of Judging Panel

Lindsay Taylor, Anglian Water

Debbie Wilkinson, South East Water

Elin Williamson, Southern Water

**Questions?** **waterinnovation@nesta.org.uk**