PartnershipBrokerage3 Edited

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**SPEAKERS**

Vadim Zagainov, Biomicrogels UK Ltd, Anastasia Bolton, Satellite Applications Catapult, Alaa Abbas, Liverpool John Moores University, Ben Tam, Isle Utilities, Unknown, John McGurk, Quell (AJEA Products), Julie King, Waterhound Futures, Guy Meiri, IOSight, Jacob, Waterhound Futures, Pranav Pasari, Satsense Solutions, Ross Damerell, FLYD Ltd, Daryl Williams, Imperial College London, Bernard Auton, Maiple, Paul Egan, 8power Ltd

**Ben Tam, Isle Utilities** 00:05

Hi, everyone. Thanks, everyone for being so promptly. We're just trying to get our speakers all lined up behind and into making sure the audio settings are working. So thank you very much for joining so promptly to kind of run just for a second mode so that the final participants join on.

00:22

Just a second, then we'll kick off.

**Unknown** 00:39

Can you see me that Ben?

**Ben Tam, Isle Utilities** 00:43

Yes. Although not sure that was

**Unknown** 00:46

 a man.

**Unknown** 00:55

Now, we can't see you at the moment.

**Unknown** 00:58

All right.

**Unknown** 01:01

Click on that rename

**Unknown** 01:06

me.

**Unknown** 01:14

Why's that?

**Unknown** 01:18

Stop video.

**Unknown** 01:23

any better?

**Unknown** 01:25

Yeah, yeah. Yes. Yeah. Who's the IT person? Give me some advice anyway.I was trying to join a meeting in teams.

**Ben Tam, Isle Utilities** 01:44

Right. Well, thank you, everyone, for joining us. Welcome everybody to this second brokerage session, session three. And because we both we had had the first one, which was more finely about some of the key priorities in the water sector from the water companies themselves. And this is the second of two where we're having quite exciting short pitching sessions, keep quite high energy and also given the opportunity to have a number of quick presentations to, to the sector of a water company. So I know well represented today on this call. Because we're using zoom. And because we're chopping in with lots of presenters. Bigger people keep that keep the cameras keep muted during during the event, and then two questions if you want. I'll try and ask questions through slideshow like we did last time. Some people put them on the zoom chat we're trying to go on there. We also try and pick them off. But you pass them through slideshow. If we have time. I admire someone's while meeting Come on, but purely in the in the basis of trying to get through as many presentations as we can fairly as possible, then just send them through slideshow. If you go on to slideshow, like every other, like last time, the code or the hashtag is IWC. And we'll pick up all your questions in there. And we are like I said, we've got lots of water companies on land on this call. But we also got off what and we're going to call it and see Matt is there Am I just past two seconds, okay. Just to introduce yourself and say just say hello. But if not give an opportunity between presentations as I know, she had a couple of difficulties with audio just now. Great, then nothing says this session is being recorded. The session will be hosted so that everyone from sectors can be up on the new website, the IWC website. Great. Next slide. We're really lucky today. presentations are going to be as quick as I can to talk through what's just the overview of the fund and then get get going with some of the presentations. And thanks straightaway to all the presenters for putting time in today.And next slide.So we the same format as last time, it's really quick. It's four minutes for the for the partner presentation, have a couple of minutes or clarification questions. If we don't get through all of those questions. The reason being slider is that we can keep a good record for them. And we can try and pose them afterwards or at least not lose things. So bear with us. We can't answer all of them. We might have a small amount of time at the end, I try my best to substitute in any of the key ones, then pretty sure your question wasn't answered, then D sharp will try and get an answer back for you. And to use the voting Up button. If you see somebody on there just similar to your question, and you really want to get asked. Next slide.So everyone now has got the distinction between the two parts of the competition. We're very much focused on the innovation and water challenge at the moment, we're pleased to say was launched last week. So we know that. A lot of partnering is ongoing has gone on. And in fact, we have heard of some presentations from last week have led to early stage proposals being put together entries for the competition. So she's really great. And the timeline is that the round was shots ended February 26. And then we'll move on to the judging period. And then money awarded in April, Dawson Hughes, we're coming up on the competition in due course, launching in spring, next slide. getting ahead of myself on the slides, but there you go. That's the timeline. And it's quick, it's fast. And hopefully this will get things moving in the right direction for some of the innovation ideas we've got. Last slide. Be really clear. The lead applicant for these for this competition is a water company. One of the 17, or one of 26 includes the nav as well. And it can be led by one water company, but welcome lots of water companies working together on them. Also with one partner or multiple partners, challenging sometimes in the timeframes we've got here, but is open on that side. So we've had a lot of questions on that last week. I think it's my next slide, which I think should be our first presentation. So I'd like to get Anastasia to unmute. Come on camera, and we'll give you four minutes to present.

**Anastasia Bolton, Satellite Applications Catapult** 06:31

Fantastic. Thank you very much, Ben, can you hear me?

**Ben Tam, Isle Utilities** 06:35

Loud and clear. Thank you very much. Never give you four minutes.

**Anastasia Bolton, Satellite Applications Catapult** 06:37

 Thanks. Wonderful. My name is Anastasia Walton. I am from satellite applications catapult and I'm talking today about satellites enabled solutions or solutions enabled by space. In particular one we will be focusing on the monitoring water dam stability and modeling incident response. Next slide please. But let me Please tell you a little about catapult because I think it's important to understand to be one of the nine catapults here in the UK non for profit partially funded by the government technology in innovation organization, which is basically looking to showcase the power of satellite and space data to other industries like yourself. Next slide, please. But why space you might ask him Is it accessible because it's a conception that the space is quite expensive. You probably not know that space has been undergoing a revolution for the last 10 years and now we have a low cost access to space. We have absolutely free data free imagery available from space we have regular coverage of course, we have regular coverage here in the UK. With this data we have data every six days over the UK in the sense of capability increased so we can understand and read from data from space quiet more than insufficient than before Next slide please. So, what I am proposing be proposing to develop remote management and monitoring system it will be remote service to provide intelligence on the water dam stability, it will be predictive to to reduce the risk of failure of the water dams. It will provide timely planning and forecast model in case of the emergency it will be combined technology satellite technology with already existing technology possibly powered by ground sensors. And of course, we are offering simple interactive visualization which many could understand. And this could be scalable, national wide. And of course we offering collaborative approach and of what has a challenge team which is ideally suited for this solution. Next slide please. In terms of the impact, the safety is, of course vitally important, especially those dams which are located upstream and near heavily populated areas. And the consequences of the such fail could be really great. So the proposed development of the remote management and monitoring system could really help with early warnings, which could help to save lives and prevent environmental damage. This would be the tool which would help to make fast and informed decisions. We could help to reduce failure, risk and associated costs. With that we could improve asset management and monitoring. And of course, we can also have a look into the past because satellite data goes years back and we could analyze the historical data and satellite technology is open to work in combination and collaboration with already existing methods. Next slide please. You would ask how the technology work. It's very simple. I put several slides to explain the hoop you will have more time to have a look later. But basically what is the analyzing the image from space and we could understand the movement of the ground in the millimeter accuracy from space and we could understand how points on the ground are moving and when we have a lot of points on the ground. Of course we can have a more full picture. Next slide please. Here's an example how the technology already used in mining. This is example how the analyzing the the same technology tailings storage facilities are telling them. Next slide. And there is some examples of how already space information helping to really create the models and scenarios for it. In case of the emergency in case of the fail of the dam, we could really have those advanced warning systems and automated systems systems, which will predict them which will show us by minutes what is going to happen next, so we can do better planning. Next slide, please. And here I put some of the existing platforms and visualization tools, some of it is already already in place. The one you could see here for the tailing monitoring said the top and the bottom, you could see the one which is looking over the flats and predicting the floods. And the one on the right hand side is looking over large infrastructure such breaches. Next please. I also wanted to mention that catapult Human Centered Design and collaborative approach is really important because we really trying to ensure that solution which we design is based on the depth understanding of the needs and requirements. Next slide, please. And he would be looking forward, I hope to build relationship today with one of several water companies. And I hope to develop the solution into the initial pilot, which we can take further. Next slide. And I know there is another space company talking to me with other solutions from space. So I put this slide together for you to read later. And the last slide, please. And he is my thanks to you for listening. And I'm looking to talk to you happy to answer questions and happy to discuss this solution or any other particular solutions, which you think would be powered by space data over the email, which you see on the screen. On slide right now. I think

**Ben Tam, Isle Utilities** 12:00

you covered, you covered a huge amount then. So I appreciate that, I could see that you had a large number of slides. So if you're happy these slides will be available at the end as well for for people to digest in a bit more detail.I've been looking at questions here. I'm seeing anything coming through on slider and as people leave in here just for a second. Do I have a quick question to drop on that and then do shoutouts.

**Anastasia Bolton, Satellite Applications Catapult** 12:28

While we waiting, I just wanted to mention that the catapult is quite large organization, particularly our satellite applications, catapult and we have various departments which are able to support us from the starting of the beat and during the development of the project as well.

**Ben Tam, Isle Utilities** 12:45

Thank you, I can't see any questions. There's a couple there but not related to this related to the fund. We might have time at the end this will happen last time people get a bit warmed up. And we have a few more questions as we go through. So I made sure they're directed to you at the end of your sit around at should be backward classified. Thank you so much for taking the time to do that and do your presentation. So we're all lined up today for another presentation in a similar sort of area, actually another satellite technology. And I'd like to invite Pranav to present I'm just going to mention again, just really quickly this will be recorded. So it'll be up on the website at some point with the trailer with a transcript on the on our IWC website. The floor is yours again four minutes.

**Pranav Pasari, Satsense Solutions** 13:35

Thank you, Ben. Thank you, Anastasia for the excellent introduction and a segue for us. Very good afternoon to all my name is pronounced passare. I'm the technical director and co founder assassin Solutions. Today I'll be sharing three solutions that use satellite remote sensing for the management of Water Resources. Next slide please. Satellite remote sensing is the use of spaceborne sensors to monitor resources and activity on the ground. I'll be providing an overview of the following three services catchment area management, water quality assessment and water budget estimation. Our water quality assessment solution has been funded by the European Space Agency. These solutions meet several of the affair challenge teams, specifically responding and adapting to climate change, restoring and improving the ecological status of water environments and managing long term operational resilience. Next slide please. As many of the water companies here have extensive catchment management practices, the importance of having healthy catchments is well understood. I'll be showcasing how satellite data can be used to facilitate and enhance catchment management practices. Next slide please. In this example of a catchment management case study satellite derived topography data is used to demarcate catchment boundaries and determine flow directions land use and land cover is assessed within the catchment hazards and risks specific to the water resources are then identified. In this case a salvage yard very close to the reservoir with the with the drainage direction towards it is identified. Next slide please. The second solution we would like to share with you is water quality assessments using satellite remote sensing. The working principles of this process are indicated here, the inherent optical properties of surface waters are evaluated and parameters such as total suspended solids, chlorophyll a concentration color dissolved organic matter and transparency can then be assessed. Next slide please. In the images here we see TSS assessed in a reservoir and a river. As you can see water quality parameters assessed are spatially represented for the entire water body. Unlike point data collected by conventional methods, this solution can be used for the early detection of harmful algal blooms, managing sedimentation of reservoirs, and bath water quality assessments amongst other applications. Next solution please Next slide please. The third solution we'll be presenting is water budget estimation. This allows water managers to understand the amount of water entering and leaving a river basin. the working principle of this process can be seen here the main factors assess the precipitation evapotranspiration and discharge. Next slide please. In the case study shown here, the area of the entire River Basin is demarcated the different watersheds and drainage directions can be seen. water available within a river basin may be estimated by deducting evaporation transpiration and runoff from the total precipitation, precipitation evapotranspiration and changes in terrestrial water storage can be obtained from satellite data, land data simulation models, and in situ data may also be used. Next slide, please. Due to the time constraints we have, we have provided only a brief overview of the solutions. These solutions provide numerous benefits, they are comprehensive and efficient when compared to conventional methods, and can also be used and can also be more cost effective. We will be happy to have a detailed discussion with any of the water companies, we are looking to partner with water companies implement one or more of these solutions in an operational setting. Next slide please. Thank you for your time and consideration. I'd be happy to take questions at this time.

**Ben Tam, Isle Utilities** 17:42

Thank you for your presentation, succinct and clear. And some some things that I think would be a good call out to the sector. But one question here that might be a couple of others, which come through this dive into those many parts of the Western UK cover which I'll cover as much time, I'd say probably mostly UK tax? And how would this impact the use of satellites? To gather data?

**Pranav Pasari, Satsense Solutions** 18:06

So it's an excellent question, actually. So we actually did a feasibility study for one of the England based water utility companies. And we actually analyze the cloud cover. And because many of the satellites have frequent overpass over over the UK, we found that we were able to get at least one water quality assessment every week. And most of these were for all 12 months of the here. So because of the the frequency in a an overpass satellite overpass, we were able to get consistent data over UK.

**Ben Tam, Isle Utilities** 18:49

Thank you for that

**Pranav Pasari, Satsense Solutions** 18:50

. And if there's a specific water utility company, we will be happy to do a feasibility check for them. And you know, give them an estimate of how much or you know, how frequent can assessments be performed?

**Ben Tam, Isle Utilities** 19:03

Thank you have any other questions there. But I might just bring on stage on two lines rather than just because we've got two satellite technologies here. One just to give a very short answer to that. But also, there's a question here if he stays around, what is your protocol around data ownership and governance? I guess that also goes to you prior as well.

**Anastasia Bolton, Satellite Applications Catapult** 19:26

Thank you. If I reply to the first question in terms of the cloud coverage, I want to say the solution I proposed is not affected by clouds because we are proposing to use different types of the data. It's read the data, so it's not affected by cloud data and neither affected by night. So we always get this type of data. Probably some of the solutions are affected by other data, but not the one they proposed in it regardless of the protocol around the data ownership and governance. Of course, this is the question to the satellite companies, which providing data for commercially for money. I was talking about opportunity and possibility using also free data which is available for the Copernicus program those satellites called Sentinel one and Sentinel, two, two different types of satellite. This data is absolutely free. And also, it's probably worse to remember, once you downloaded and processed the data and good analysis of the data, you have analysis to yourself, and you probably no need of the data anymore.

**Ben Tam, Isle Utilities** 20:31

Thanks for that answer. Pranav, Do you have any thoughts on that one very quickly, I think as soon as you put it in wonderfully. And you know, that's absolutely right. We do use central to satellite data, which is freely available, and it makes the offerings very cost effective. There might be some use for commercial satellite data. And, you know, if if a customer does want to purchase that data, they could have full ownership over that as well.

**Ben Tam, Isle Utilities** 20:59

Thank you. So just one really quick question. How have you seen on zoom? I've run out of time. So short answer to stat sense. Can you measure the ponded acreage on farmland from the precipitation event software?

**Pranav Pasari, Satsense Solutions** 21:13

Could you repeat the question please, then

**Ben Tam, Isle Utilities** 21:15

 can you measure the ponded acreage on farmland from the precipitation events software that you have?

**Pranav Pasari, Satsense Solutions** 21:24

A precipitation. So I think the precipitation data that we collect is over an entire River Basin. So it will be difficult to estimate or smaller areas. Okay. Well put that question on to it. Maybe you can answer that directly or dropping there as well. sure how much both for that. I'll move on. Thank you. Thank you, Ben.

**Ben Tam, Isle Utilities** 21:46

Bernard's got the next presentation. Great. So the smarter networks program as Francis or Bernard that will get going on that presentation.

**Bernard Auton, Maiple** 22:05

Good afternoon. Afternoon. My video on as well.

**Ben Tam, Isle Utilities** 22:14

You ready to go.

**Bernard Auton, Maiple** 22:15

 I'm ready to go. Pro.

**Ben Tam, Isle Utilities** 22:16

I'll give you four minutes. They go.

**Bernard Auton, Maiple** 22:17

 Thank you. Good afternoon, Francis tonight from maple. Maple helps organizations make better, faster decisions that improve your business using machine learning artificial intelligence and your deep subject knowledge. We would like to work with water companies for four linked projects, building on a very successful pilot with Welsh water to prove a day ahead energy forecast. These projects will reduce your energy costs, improve visibility of network performance, reduce your maintenance cost and improve your energy forecasts. The water industry consumes a large amount of power now Next slide, please. Sorry, we still have two slides. And the next one, please. Water NZ consumes huge amounts of power. It's the water company's highest cost after people. Most of the power is consumed in the wastewater network, where variations in energy demand determined primarily by rainfall. Let's have a quick look at these four linked projects to reduce costs. By the way on each slide, we show the technology readiness level, the TRL, where we are now in orange, and where we want to be in the end of this innovation. It was a program in darker blues. Next slide please. Next slide. Thank you. There are five steps to creating your demand side energy use forecast, you can use this accurate prediction to procure power from generators, and aggregators at less cost. A better forecast means the energy companies can provide more electricity from renewables and balanced loading across the grid. using less energy and a higher proportion of green power across a better balance net grid makes a significant contribution to our net zero targets across the water power Nexus. Next slide please. We then compare the actual versus predicted energy used by each pump. If a pump is using more power than we expected, that might indicate an issue with the asset. If it's using less power than forecasts that might indicate a problem upstream in the network. These anomalies trigger alerts in your control rooms and management systems. Next slide please. Maple can monitor the energy consumed by a pump 10,000 times a second. This very high frequency sampling helps us to characterize the pump changes and the equipment profile Warners of component wear and failures before it stops working. condition monitoring of your network helps prevent pollution penalties. costly, disruptive breakdowns, reduces maintenance costs and informs your capex priorities. Next slide please. Mabel wants to work with your teams and partners across the sector to continuously improve forecast accuracy interpretation of existing and new data streams, such as those from satellites, water companies have to watch the weather for hundreds of years. But now you have access to a lot more data from many more sources in real time. We use artificial intelligence to help you interpret all that data generate better information to reduce both your costs and your carbon footprint. Next slide please. We work together to ensure your team's deep knowledge and knowledge experience is embedded in the algorithms on Maple AI platform. We use models including machine and deep learning, understand your data and deliver informed recommendations. We connect to various devices cloud to edge based deployed across diverse, robust and secure networks. With a greater understanding of your operations, you can make quicker better decisions. Next slide please. To help you understand our proposals better, we prepared a more detailed documentation, including project plans, budgets and a risk register. These are based on our experience running a proof of concept with wells water last year, we forecasted the energy required by 129 pumps over the next 24 hours with 85% accuracy. Well less than 20% of the assets, these pumps use more than 70% of the energy in the network. Well, squadra confident they could reduce their energy costs as much as 5%. With this accurate, more timely forecast, monitoring their network in real time would also reduce OPEX and capex. We want to work with other water companies to generate a demand side energy use forecast and help you procure green energy at less cost. We also want to use energy data to monitor the condition of your network. We wish we had more time to get together as soon as possible to discuss these opportunities in more detail. So that maybe one of you can put these ideas forward as a great innovation in water. Thank you for your time. We welcome any questions.

**Ben Tam, Isle Utilities** 26:58

Thank you for your presentation. Thanks. I'm getting pretty close that for me and mark and you covered a lot of ground there. So appreciate it. It's tough. there's a there's a question here, which just comes through, so dive into those.What are the estimated timescales to progress this technology through those subsequent TRL?

**Bernard Auton, Maiple** 27:18

We estimate that we can move those crls. Within the six months of the innovation, we anticipate the innovation of water change taking place between now and the end of 2021. So we anticipate being able to move those forward in that time period.

**Ben Tam, Isle Utilities** 27:35

Well, as another question here, is there an example related to the water only companies?

**Bernard Auton, Maiple** 27:44

No, not yet. Not yet. But they they will we

**Ben Tam, Isle Utilities** 27:50

get? That's all the questions I can see on there. If anyone else is there, they got an urgent one, quickly type into zoom or onto the slideshow. If not, maple can be contacted, they have contact details, their slide deck will be available, this is being recorded, I urge you to reach out and if that piques your interest. Appreciate it. But on Francis for presenting today and putting that together and sticking to time there. I'll be in touch soon.

**Bernard Auton, Maiple** 28:26

Thank you.

**Ben Tam, Isle Utilities** 28:29

Moving on to our next presentation. We have one from Imperial College London, Professor Williams on the line.

**Daryl Williams, Imperial College London** 28:37

Yes, good afternoon, everybody. Great stuff. I'll hand over to you. And you have your four minutes. Great. Thank you very much. So this afternoon, I'm going to speak to you for next for the next four minutes and talk to you about some multifunctional autonomous water quality sensors. We've been working at Imperial College for the last three years. And I'm just showing you an image in the top right, which shows you the actual completed Center, which I'll describe in a moment, but it's basically the size of a small pin. Next slide, please. So the first bit of background on the project. So we've been working for the last three years with the Department of Electrical and design engineering and also with a global automation partner. And really, we're trying to deal with the following challenge. If you look at the sort of instrumentation is commonly used in the water industry, it's remained relatively unchanged for 40 years. So devices are measuring flow pressure, temperature pairs continually, you tend to end up with very large, expensive, heavy cable dependent high resolution highly invasive, permanently installed and sensors only to a single measurement. So on the right you can see a large flow meter. These are big, expensive piece of infrastructure. And the question we posed ourselves is how could we revolutionize the industry we had sensors it was small, little Lightweight cable independence, I mean self powered and wireless, did more than one measurement with low capital maintenance costs. And it could be potentially put in a network as pervasive way. And a devices or devices of this type would allow us to deal with some of the big challenges of what in the world industry face asset management and monitoring for maintenance, Leak Detection and reduction, monitoring water quality, reducing energy consumption. And the idea really is to use the sort of sensor technology that you find very much used in mobile phones these days. And we developed in devices using the sort of sensors you see on the fingertip there, which are very small, low powered, they're easy to deploy, they're intelligent. And once you've got wireless data is there also the opportunity around the cloud and large data analysis. And we chose award history as a target market for our first generation device. And the device that I'll talk about today has got seven measurements currently, images water temperature, or pressure, water flow rate, water conductivity, and external to outside the pipe measure the external vibration and external temperature. Next slide, please. And this gives you a quick schematic of the device, is it it's quite small and the actual, we have developed a way to essentially introduce the device into a pot. So we have a way of inserting the device via a very small hole into a pipe. And that allows us to actually measure the properties of pressure, temperature, flow rate and creativity without having to pull it apart without putting large infrastructure. So we can with a very small hole, insert our device into a pipe from two inches up to as large as you want. The device is battery powered, it's on Wi Fi networkable and allows us to get wireless data in and out remotely from our device. Next slide please. So what we've done is we've developed a minimally invasive installation approach involving a six mil hole, and we can install in the pipe above or below ground, or the sensor array itself is very small data size, or PIN six mils in diameter 150 millimeters long. And we can actually reply, once we've got the installation in place, you can insert or remove a sensor array within five minutes. And we measure the seven properties via the battery and water system. And it's a flexible platform. So other properties can be added in due course. And we measure data both on the on the water quality and the pipe environment is can go to the cloud, the integrated award network datasets. We're currently building 10 units at the moment. And we're looking around a field trial in 2021 to look at the performance of these sensors inside a real word network. So we're looking for a Waterberg waterboard partner and supporting Thunder for a field trial. And the objectives for the field trial given their field trial they are given there. But we're looking to see what's the data we can obtain how they can help you understand and better manage your water network with these low cost, easy to deploy, and battery wireless technology. And those slides are there for you looked at I'll quite keen to have a couple of minutes to take any immediate questions that you have. So I'll stop talking now. And I'll take any questions you have.

**Ben Tam, Isle Utilities** 33:08

Thank you very much. That helps and appreciate lots of information on those slides. So I'll dive into some questions as they come in, coming fast through few and I'll start with what is the lifetime of the sensor, you know, so far anyway.

**Daryl Williams, Imperial College London** 33:23

 So the current the first generation devices for this trial are designed for a six month trial. But the longevity of the devices depends on how heavy the batteries are you put in them. So we can have them for two or three years in long bed for the trial, the batteries are designed for a minimum of six months life in the field. Okay, so that kind of wants these other questions here is that the battery life drive says if so is there a difference between what you're going to trial in this and what you'd hope for in the future. I mean that that's a function discussion with our client. I mean, we can put bigger Petrosian and we could have two or three year life quite easily if we wanted. So at the moment journey questions size of the battery, there's no other technology constraint, the batteries are quite small, the batteries are probably about four centimeters by about two centimeters by their force in a minute. So if we had a bigger battery, the life just scales automatically. There is also a possibility future of adding energy harvesting. We haven't got that at the moment. But there are scope for energy harvesting and the technology as well.

**Ben Tam, Isle Utilities** 34:14

Brill. Does it have any alarm functionality.

**Daryl Williams, Imperial College London** 34:19

 It will have alarm functionality. I mean, the devices as very intelligent programming the devices, so they can they will automatically upload data to the cloud. And that can include local alarm data. So yes,

**Ben Tam, Isle Utilities** 34:31

for the last question here has been quick, fine. Is there a plan to include turbidity?

**Daryl Williams, Imperial College London** 34:38

Well, we had we had a list of about 10 in our list, and the two that are in this particular device are turbidity and Ph. But we do have approaches for both of those. But we really felt we needed to get close to the water board and get better alignment with their needs. But we certainly have some approaches for doing turbidity and that is a possible technology we can incorporate in a future version of this device.

**Ben Tam, Isle Utilities** 35:01

think what's out there, there's kind of, you can see here there's a line of questioning, if you're really interested in terms of how that might work. It sounds like actually for this is a trial to become a partner project. And they do some, some work to do with was coming to understand exactly what they need from this design outfit. So I know Jenny Woods company's here. So I'm hearing something here, which they think is really interesting to be in touch with, with our colleagues, and to take it from there. And if you're struggling to connect in any way, then do get in touch with us. But all the slides be available. All the contact details are on the slides here as well. Sorry. I've posted my email address on slider if you can't find it. Perfect. Appreciate that. Thank you so much, nation.We just moved the slides on there we go. Great, Toronto. Our next presentation is Vadim there. Meet yourself.

**Vadim Zagainov, Biomicrogels UK Ltd** 35:57

Yep. Good afternoon, everyone. Do we need a video launching house? Okay, so I can start.

**Ben Tam, Isle Utilities** 36:06

 Yeah, absolutely.

**Vadim Zagainov, Biomicrogels UK Ltd** 36:08

 Thank you very much. Good evening everyone. My name is Vadim Zagainov I know. I'm Chief Commercial Officer of biometric geo UK limited. Our solution today is for the industrial storm in wastewater cleanup from oil fats and petroleum products please Next slide. So basically about the product biomega gel is a sub micron polysaccharide partners have obtained from byproduct of agri food culture that is basically our raw material our apple beetroot pulp and cellulose. Our product effectually captures the oil and fats as you can see on the picture. So we have a huge range of products and solutions for such areas as the recycling of coolant oil spill response treatment of water sediments, but for this particular word we suggest to use our fluc along BMG situ is suitable for cleanup of Balam and produced water industrial wastewater cleanup.And the main characters are the product is that it's non toxic and eco friendly. Basically all our product plant has for lowest environment as a class is used lower decision than the traditional chemicals is localized impurities and easily captured from the water. Next slide please. Our main impact is that we show the treatment result less than one milligram per liter. The forum's reside you three times faster than the competitors. And we have we can see the wide operating range of concentration temperature Ph. And we also provide three main benefits you will have the instant increased and constant water quality reduction in the use of traditional chemicals and use our fully biodegradable mic diameter gels. Next slide. So basically on the status we operates in European Union, Russia, cis USA, Australia, Brazil, we have more than 60 patents in more than 50 countries. We have two production plans for labs, we have our own r&d engineering support. And next slide. briefly about the reference we have previous year we work in several style company we separate more than 300 square meter cubic meters per day of cutting fluids. And we show the result from more than four and a half 1000 milligrams per liter to the range of around one milligram. That's the success. You also heard about disaster on the north of Russia last summer in the risk, where we bring more than 3000 square meters of our feeder close and we bring up from the rivers more than 8000 pounds of diesel and bring it back to the cycle. After that we get the recommendation of Ministry of Emergency for Russian Federation. Regarding the today's bullet we have activities in the canals and Russian Railways with the storm water treatment where we clean up for more than 400 square meters per hours and we show the treatment result from more than 400 milligrams per liter to less than 0.07 milligram. Next slide.Also we were we got the certificates of after trails and tests we received the certificate from European Commission in horizon 2020 as the high quality project proposal, and also Aqua tech best technology. That's basically it. Thank you for your attention. And thank you Ben for support. We'll be glad to answer your question.

**Ben Tam, Isle Utilities** 39:36

Thanks, Vadim for a quick sharp presentation. They're very clear about where this fits. I can't see any questions at the moment coming up. We have one actually dive straight in and is the main application of this flocculent mainly targeted oils and fats. If so, what is the subsequent separation process is our flocculation process. So what you do next

**Vadim Zagainov, Biomicrogels UK Ltd** 40:00

So you can we can make a recycle so we can bring the products, oils and petroleum products back to the cycle. Or if if it's not necessary if the the constant is low, we can just utilize it we have the more European grades and the scale that we can easily utilize it. So it depends on the customer needs.

**Ben Tam, Isle Utilities** 40:24

Thanks for that answer. Another one, how do you dispose of the waste collected?

**Vadim Zagainov, Biomicrogels UK Ltd** 40:32

Well, you will have some activators we use for this project. And also, in addition, I want to say that with our current customers, we are working as the supplier of the chemicals, we also provide the service. And we also can bring the capex of the for this solutions as well. It depends on the customer needs.

**Ben Tam, Isle Utilities** 40:57

Okay, please. Yeah, clearly, wherever you you've marked up needs to go go somewhere afterwards. But I have a question later. Yeah. The final one here is that Canada water wastewater customer use the same chemical free and delivery systems for existing coagulation chemicals, we get

**Vadim Zagainov, Biomicrogels UK Ltd** 41:14

 short, it's in combination. So the customer will stay, we can stay with the traditional chemicals, but he will reduce it. The volume two or three times depends on the water quality. And what's most important that we can implement in the same scheme that the customer have now so there is nothing special needed. We just have to look through and find out where we can put so there's no capex investment. for that. That's the main benefit.

**Julie King, Waterhound Futures** 41:44

Okay, thanks for I believe it that there might be a couple of other questions and we'll try and get them answered on slide. Thank you. Thank you. Moving on, our next presentation is on water hounds. Judy King few takes off meat on the floor is yours. Thank you.

**Julie King, Waterhound Futures** 42:05

 Good afternoon, everyone. My name is Julie King. I'm CEO of Watertown futures. Next slide, please. waterhemp has converted a proven offline predictive simulation modeling tool to cloud based software to optimize water and wastewater treatment assets and processes. It's based on science with underlying algorithms developed and proven over 25 years. Our database covers over 300 process modules, and 800 input parameters. Water hound addresses to offwhite challenge themes. Number one long term operational resilience and infrastructure risk for both customers and the environment. And number two water hound solution mitigates risks and sustainable and efficient ways. Our software is novel and represents a sea change for utilities and optimization of water wastewater treatment because of its versatility, as a tool for use and design, operations and management, and it's learning application of machine learning enables optimization against multiple criteria. For example, energy use chemical dosing, and regulatory compliance. Next slide please. as you can as you saw on the previous slide, water hound software is a risk assessment tool, providing management with transparent science based data analytics from within their system that is independent of supplier bias and operator error. This includes risk assessments for performance, partial and complete component and plant failure and environmental risks and consequent reputation risks. And importantly, using water and software to optimize a treatment system goes to mitigating climate risks by reducing abstractions of local freshwater supplies, chemical usage, and by minimizing energy consumption to lower the carbon footprint of operations. This helps to reinforce goodwill within the communities where your operations are located. In terms of cost reductions, improvement in performance optimization, and reductions in water, energy and chemicals in operations. Companies have historically reduced OPEX between eight and 38% with hardware designed using the underlying algorithms in waterhouse's software, next slide please. As I just mentioned, our offline model has been Applied successfully in a range of industrial wastewater treatment plants for Fortune 500 companies, the software is ready to test as an independent tool or to augment functionality and versatility of existing software packages you may already be using, or asked today is for an opportunity to apply our learning from the industrial sector to the utility sector. To do this, we require access to data and to plants. And we are able to also provide a COVID era compliant remote access access and monitoring option. Next slide please. Thank you very much for your consideration. My colleague, Jacob Tompkins, will join me now for the Q and A's

**Ben Tam, Isle Utilities** 45:58

thanks, Jerry. Welcome, Jacob has a question coming up on sliders which is give out a moment as they come up. I guess in that few seconds you might have now is that you're just redefining that asks that you have any potential water companies there? What sort of applications do you think is the closest to to putting this sort of software to work on?

**Julie King, Waterhound Futures** 46:23

In in the water utility?

**Ben Tam, Isle Utilities** 46:25

utility?

**Julie King, Waterhound Futures** 46:26

 Yeah. Well, wastewater treatment optimization of the of the actual hardware and the processes as well.

**Ben Tam, Isle Utilities** 46:37

And there's a question here, I should just come in. So are the savings, the eight to 30% savings? Is that just tax?

**Julie King, Waterhound Futures** 46:47

It is just op x, although there can be capital capex reductions as well by using the software and design.

**Ben Tam, Isle Utilities** 46:56

Thank you. Are there any real time online case studies?

**Julie King, Waterhound Futures** 47:02

There are no case studies at this current moment in as an applicant as applied to utilities, for industrial, we have case studies from use of the offline model. And we have a couple from use of the software. So we have also done our own internal vetting of the conversion to the cloud based software based on what we know has been both used and the results from using the offline model for the industrial applications. We have both but not specifically real time for the end for the utilities.

**Ben Tam, Isle Utilities** 47:54

so to speak, this final question here. It's asking, yeah, how is your offering novel?

**Julie King, Waterhound Futures** 48:01

Jacob, I'm gonna turn that over to you since you're the technical expert here. Okay.

**Jacob, Waterhound Futures** 48:09

It's able to do multivariate assessments, using AI machine learning tools built within it. It has 300 different processes for wastewater treatment plants that it can use. And it can assess about 800 input contaminants. So it's probably the most comprehensive system. And each of those algorithms for each of the processes can be built in any format you want. So effectively, you can build unique digital twins of any wastewater acid.

**Ben Tam, Isle Utilities** 48:48

Thank you. There's a couple other questions. Yeah, they're on slider. Actually, I'm just put in a bid to stay on time here. You're welcome to to answer those directly on slider to them or pass us an answer. I'm going to go through some kind of more technical, which is great. Follow up individually, and between the board companies and technology company, there is something to talk about.

**Julie King, Waterhound Futures** 49:13

Great. Thank you, Ben.

**Ben Tam, Isle Utilities** 49:14

Thank you. Thanks, everyone.next presentation. Hi, john. Thanks for being there. Hello, Hunter with you.

**John McGurk, Quell (AJEA Products)** 49:27

No problem then. Good afternoon, everybody. I'm a little less tech than space and artificial intelligence. But following storm Kristoff last week. My presentation is somewhat topical by focusing on flooding and outcome delivery incentives or otas. Next slide. When the water utilities came into existence, they inherited an infrastructure network, much of which was built in the Victorian era. its creation was a result of massive government expenditure and asstill considered a marvel of engineering. However, experiencing its usage now far exceeds its designed demand. Audiences as we know can act as the reward or penalty. Penalties for internal flooding can be significant avoidance of all the eyes measures to prevent internal flooding need to be taken. in certain instances, mitigation measures to the properties are preferable to the cost of replacing large sections of aging infrastructure, or innovation aims to assess the water companies by helping to solve pressing problems that lack solutions. Next slide. Because we all know, climate change is irreversible, with flooding considered one of the most widespread and destructive side effects of it. Next slide. Next slide. Yeah, so why as mitigating against climate change and achieving operational resilience, sorry, go back home has been so difficult so far. I believe that this is due to the fact that all mass market flood protection systems are manual. Meaning in order to have any efficacy at all, end users would require advanced notice of a flood and the physical strength to retrieve it and some storage and and possession and the dexterity to install at for them to have any use at all. Next slide. Well is different. Again, changing level of performance delivering 24 seven protection, autonomous deployment that doesn't require any source of part, easy to install and maintain quail is as close to fit and forget as we think is possible. Next slide. So hopefully our video plays. And for the video, we've removed the enclosure and the LED to expose a single module of the barrier system to illustrate how it reacts in a flood event. Once the critical buoyancy level is reached, the autonomous deployment begins the single module and this test tank has been inundated with 1.6 tons of water. The patented design controls how each section detaches from the core and subsequently attaches to the freedom. This is achieved by magnetic strategically placed in each section. The entire module is wrapped in a closed cell foam rubber material. This elegant solution acts not only as a living hinge between the sections, but also as a watertight gasket. Meaning that the greater the pressure on the barrier, the more it is compressed, enhancing the watertight seal. And the close up views you can see the black core element of the barrier. This is highly buoyant, yet impact resistant epap a molded foam. The coil flood barrier system has been designed to address the negative impacts of climate change by harnessing the forces of the flood to protect properties, critical assets and communities from that flood. We hope to collaborate with the water utilities through the innovation and water challenge to demonstrate that a simple, yet effective solution can address the evolving needs of customers, society and the environment. We believe that a successful collaboration will enable us to validate our solution which would then be readily scalable across the sector. final slide if possible. Apologies for the just go to the next slide. Awesome. So thank you all for listening. I'll be happy to answer any questions or my email address is on screen. Be happy to follow up at a later point

**Ben Tam, Isle Utilities** 53:47

is john Mosley made the videos work or stream a live lesson as always in achievement on that side. Thanks for that, I think quite clear product there. And definitely if needed, I can't see any questions jumping in with you. It's always a good sign also because you'll get your presentation. We'll give it just a few more seconds. There's work there's one question here. So yeah, I mean, it's quite a question why why the water wastewater companies what support you need from from your water companies specifically?

**John McGurk, Quell (AJEA Products)** 54:23

Primarily trialing testing and real world situations. And we think that the the feedback we've had from water utilities so far is that for a second internal flooding event, the ODI penalty is very severe. And obviously water companies want to avoid those large financial penalties. So obviously, collaboration with utilities to work on that front would be great.

**Ben Tam, Isle Utilities** 54:52

Makes sense? Yeah. linemen 30 eyes on that side. That's two quick ones is are there maintenance requirements.

**John McGurk, Quell (AJEA Products)** 54:59

Very little It has been designed to be as as maintenance free as possible. And again, just an annual visual inspection, checking that the one way non return valve is operational and it should be fine and very minimal loss one quick one here, what happens is the flood level water level exceeds the maximum grow unit capacity. This goes over that particular unit has been designed for the new BSE 511 88 standard. So, basically it's a proximately, two feet plus a wave testing format. Again, the technology, the patented technology is scalable. So in theory, it could be bigger or smaller, wider bolts, the physics all works the same.

**Ben Tam, Isle Utilities** 55:48

Nice, thank you very much your presentation very clear. Hopefully we will be in touch on this side. Your details are there slides up there, this will be recorded. Thanks a lot.

56:01

Next up, we got guy from IOSight.

**Guy Meiri, IOSight** 56:07

Hello. Hi. Good afternoon. Thanks for hosting me. So okay, so my name is Gary. I'm the head of business development of IO site. What eisah does has been doing for the last 10 years or so is data management and analytics for water for different types of water utilities, water systems. And I'm going to speak today about a specific solution that we offer I should for water quality monitoring and surface water. next piece.So I should I should is basically a mature solution. It's an innovative however mature solution. It's been operational since 2017. installed at the Jordan River in Israel, Jordan River watershed and operated by McCord, the National Water Company that's our first client. It's an efficient comprehensive nursing nerve center 24 seven algorithm based anomaly detection of water quality anomalies, we basically it's about eliminating 95% of false alerts coming out from raw data and providing propagation calculation downstream. So you can respond accordingly if we have an index station downstream somewhere you can change the composition of chemicals or shutting down or whatever it has an Event Management module which provides push alerts through text messages and emails and mobile and web dashboards and also reporting please continue next one. So it addresses please to innovate innovation themes, about protecting the environment from pollution and about understanding risks and actually responded to them. Next please. I said is part of a broader Integrated Water Smart Water suite as we call it, it is based on the igreen platform the left hand side, which is the core platform data management and analytics, it's about extracting the data providing the business intelligence layers, reports, dashboards, alerts and so forth I shed is the AI type module, the algorithm based expert module for surface water quality monitoring, we have several other modules that will not focus on today we have over 100 installations worldwide. Please continue. So, we start with I shared we start with providing some sort of like like an identity identity card or passport for each monitoring station, I will emphasize we are a software solution. So we connect different types of sensors in this case, there was the single one type of sensors we we start with analyzing historical data and providing a foundation This is the passport for each monitoring station next. Then we start collecting the real time data from the station and applying the data analytic techniques on the sensors creating the Integrated Water Quality Index for each sensor and for each station and only when a certain threshold has been exceeded then an alert is being generated. So you can see green yellow red, very intuitively. Next please. And upon an event there is a downstream propagation calculation second algorithm which is being triggered, as I mentioned, helping you respond to that specific event. Next, you can see examples of the dashboards. The web dashboard as well as the mobile dashboard is actual screenshots from from a real installation and the one that I showed next place and also actionable smart reports. So twice a day or as you define it, you can guess we can get smart reports providing you insight into what's happening in your water in your watersheds in your surface water source, and also alerting on anomalies in sensor behavior. Next please. And as I mentioned in Event Management module, based on rules engine through text and email. Next, we have another project in Chicago, the HTML Chicago rents on water quality monitoring in the Chicago River. The thing about that is, is we collect different types of data from different types of sensors, actually UK based companies called RS hydro hotels. And that's the second project we have with I shared and next place. And to summarize, I'm actually I can I can stop here, I think I think it's basically a mature, it's a proven solution. It's flexible to address different types of surface water sensors. And yeah, that's it.

**Ben Tam, Isle Utilities** 1:00:41

 Thanks, guys. Thanks for stopping at that point. And to kind of check slide Oh, yeah, it was pretty good question starts, I think, what makes this solution innovative.

**Guy Meiri, IOSight** 1:00:55

So I think, as far as we know, that's the most innovative and accurate and proven solution for real time, water quality monitoring, and rivers and watersheds and surface water. So it's just not just about the data, the raw data, it's about the blind, the algorithm, it's about elimination of false alerts, turning it into an actionable solution. So you get the layers of getting the various types of data, integrating them from the sensors, and then providing the analytics as well as the the alerts and the event management. So it's kind of like a comprehensive solution. And I mentioned downstream propagation. So as far as we know, it's the most advanced and proven solution. As I mentioned, it's been used by Makoto to protect Israel's northern watershed for three years. So it's proven another aspect from there aren't any other questions but I guess we got 20 to 30 seconds, what is it you need from a water company in terms of a potential partnership project here? So I believe water companies that have source water coming from surface water, I think we're probably asked to connect to their monitoring stations if they already have sensors installed to collect data from their sensors, and maybe also other types of live data like laboratory data and weather data. And kind of like do a pilot like we're doing in Chicago right now and and hopefully you can help them identify in real time water quality anomalies.

**Ben Tam, Isle Utilities** 1:02:23

Thanks, guys. I think everyone should have it. Yeah, have a look at that case study, see if there's something interesting guys, details on here, be up online soon. Thanks very much. Thank you. on to our next presentation, we have Dr. Abbas there. So, john was good to have you on thank you very much in four minutes now.

**Alaa Abbas, Liverpool John Moores University** 1:02:55

So, my project is an innovative design for separate sewage system. Next slide please. So, the problem tackled by this design combined sewer system makes up about 60 to 70% of from the sewer system here in the UK, and many EU countries and this is caused serious pollution abroad long because the combined sewer overflow, so when the flow exceeded of the capacity of the combined system exceeded the flow discharged directly to the river. And the challenge with that water company has is that to do a separate sewer system actually is lack of space, especially here in the UK or in Europe. Whereas, narrow streets is more common and applied the occupied by a complex network of infrastructure and find the guest space to place a traditional sanitary sewer system is very challenging. So, next slide please. So, the motivation behind this research that all the new regulation imposed of using separate sewer system and all the new development and combined system is limited to use for replace or extend an existing system. So separate sewer system has two manholes and the water company is now set up the separate sewer system and all the new developments upstream the network or downstream that connected with existing combined sewer system. And we have a chance to chat with Defra about this and the answer that we need to be ready for the future two completely separate sewer system. Next slide please. And this research is one may be attempted to try to separate or provide an innovative service a sewer system can reduce the space and save construction costs. on time, so we throw this design we gather in the to system and to once new system can maybe reduce the space construction cost. So in a state of two manhole using by traditional separate sewer system use a new one manhole can maybe the flow come and the five of the toe, enter the water into the external chamber flow around the NF chamber and exit from the next row five, follow the flow kind of flow on the bike at the bottom and connected with the bottom bottom inner chamber and exit directly from the next pipe. Next slide please. So this solution represents a cost effective on the space efficient alternative to the conventional sewage technology that has used since 180 years ago. It's a protect public health environment by improved using separate sewer system, reduce initial cost by 10%. Decrease the construction time by 40% and decrease the footprint by 20%. This will minimize the disruption and city citri through an installation process. Also, this system has been tested and it's proved the structural and hydraulic properties, which can mitigate from the flood risk. Next slide please. So we test this new design in Liverpool john Moores University through more than 40 years using a physical lab for structural and hydraulic performance, use the result to validate f e and CFD model. And we believe that we are ready now to move for the next step, which is scale up this design for test and the site. And we look for one Motor Company to provide us with with the site for testing, and maybe we use it like as a platform to go for OFAC competition. Next slide, please.

**Ben Tam, Isle Utilities** 1:07:32

Just to wrap up, please. Yeah, yeah. That I would like to thank you. I'm ready to have any question. Any question? Thanks. Got a couple of questions here. Maybe it's just a clarification on the solution. One has what's the green box labeled TP signify your eyes as well? Can you repeat the question please? Yeah, what is the green box labeled TP signify?

**Alaa Abbas, Liverpool John Moores University** 1:08:04

By no I'm not get the question actually.

**Ben Tam, Isle Utilities** 1:08:08

So there's on on one of your slides for the initiative designed for a separate sewer system go back Yeah, yeah. The left hand side there TP

**Alaa Abbas, Liverpool John Moores University** 1:08:17

I think that Oh, bland that so combined sewer system is more the follow smooth to treatment plant before discharge to the reverse or watercourses actual. So this is a treatment plan. This is for new installations or it can be retrofitted. Yeah, it can use for both actually to separate an existing system. And I have maybe special video on the explanation how we can separate an existing system or can maybe set up a new separate source system.

**Ben Tam, Isle Utilities** 1:08:58

Okay, and I think the other question is around is the solution around the manhole or actually relaying of separate separate storm and sewage work?

**Alaa Abbas, Liverpool John Moores University** 1:09:12

Yeah, presents a new design for munhall different from what we use it before for more than 180 years ago. So it is a new design for manhole allow to use in the separate sewer system efficient.

**Ben Tam, Isle Utilities** 1:09:30

Thank you, Alaa. Just one quick one as well. How does that accommodate different pipe gradients and pipe diameters and widen the trench?

**Alaa Abbas, Liverpool John Moores University** 1:09:39

So we test this also and lab we set up different by diameter and it's work. There are a special criteria to do the installation actually.

**Ben Tam, Isle Utilities** 1:09:56

Thank you very much for being with us.

**Alaa Abbas, Liverpool John Moores University** 1:10:02

Thank you very much.

**Ben Tam, Isle Utilities** 1:10:07

go across to eight power now Paul Egan. If you're, if you're there are a couple. Hi, then thank you very much.

**Paul Egan, 8power Ltd** 1:10:16

Great, thanks. So good afternoon, everybody and Ben and team. Thanks so much for the opportunity for us to introduce a power. My name is Paul Egan, I'm CEO, a power Cambridge based technology company focusing on UK water to use Smart Sensor software and AI and analytics to make your dark and monitored assets into smart, intelligent machines. And we're doing this with a system we're calling fit and forget condition monitoring. So next slide, please. So I just want to take a couple of minutes just to kind of set up the the vision here. So imagine if the right people in your organization, were able to get the right information at the right time, how they could improve your decision making. We'd also like to see if you could see all of your assets and lower your risks, what would that do to help you deploy your limited resources? Now a big one is imagine if you could move from reactive maintenance to scheduled maintenance, and asset failure could be prevented. So not only would that save you OPEX, and capex, but it will also meet or exceed your od eyes. And this may sound like science fiction. But these are things we're actually doing with our customers at the moment. So next slide, please. So eight power we're solving challenge three around resilience and infrastructure risk. So without regular inspection, we know that a lot of assets can carry risk of failure, some assets more than others. And unexpected failure can lead to all kinds of problems that you see listed there and more. And I'm sure that some of the audience know some of those problems only too well. So the best way to mitigate some of these risks, we think, is to use sensors and software to automatically track and report asset health alert, you are developing issues, and will use things like vibration and temperature to actually check asset health. And if we can fix those small, small problems before they develop into critical failure, we think that's going to be the key. Now to give you a little bit of context here in 2018, you were published a report showing that less than 5% of UK water assets have any kind of condition monitoring. Well, eight power is now hoping to address that need by making an easy to retrofit system to provide assets with data and insight in a reasonable way that will enable you to do early intervention to prevent major asset failure. Next slide, please. So just want to take a couple of seconds just to look at some of the data. And again, we've focused quite hard on making sure we get the right data to the right people. And we're grateful for Anglian water to be able to share one of these historic screenshots. So in the first slide, you can see that, that we've really got some first design for managers, it's to have a quick glance and see exactly what's going on there. But obviously, if you need to, you can click through and see more detail. So the next year would be more for someone in operations or in control room that might want more detail. So actually specific temperatures, or maybe vibrations, or other calculated KPIs. Now for problem diagnosis, or by a tech or service partner, you might want to be able to see more data. And in this view, you can see how we got trends of data going over time. And it could help you maybe plot some of the other things that we're seeing there. And obviously, for the expert, we've got full, fast Fourier transform, or FFT, or spectrum view of individual vibration recordings, and the trained eye, you can see the various things going on there. So these views are available on desktop and mobile. And obviously, we've got an API to your existing platform. And hopefully, alerts can be by text, email, tweet almost any other platform. I think flexibility is our key when it comes to it. And I've got another slide on data sharing shortly. So next slide, please. So we're up and running on 15 sites with 300 sensors in the field, we've been collecting hourly data, our systems in production with Anglian Yorkshire and ABB, and we've done quite a lot of work with certain trends as well, we'll shortly be launching a new sensor that gives five years worth of data on a single battery. And obviously, with the opportunity for energy harvesting, we can actually make sensors, maintenance free for 10 years. And we've got some new software things coming out as well. So next slide, please.In terms of ideal partner, we'd be looking for a partner that wants to run a project rather than a pilot or trial. And they want to move to condition based maintenance. So and we think to get the best value out of this, it's going to be given the opportunity to both sharing data internally, and potentially with external customers as well. So we think that data sharing and particularly automating response around condition is going to be the next big thing. So next slide, please. So here's the summary really, of our fit and forget technology. It's field proven, and it's being used with recognize what UK what companies at the moment. So we want to help you reduce your op x and minimize reactive maintenance. Many companies are starting on their digital transformation journey. And we'd like to share the start of that journey with you and your partners by making it possible to actually see those assets final slide. So my contact details are on screen and it's in the slides and they'll be distributed And you can find me on LinkedIn or Twitter. We'd love to chat. Thanks for listening and happy to take any questions.

**Ben Tam, Isle Utilities** 1:15:07

As Paul, thanks for going through that, again, lots of information there. And pretty clear about the ask to the sector. I can't see any questions jumping through at the moment. That will just carry just two moments. Yeah, sure. What do you need a sensor for each piece of equipment.

**Paul Egan, 8power Ltd** 1:15:31

So what we've done so far is we prefer actually, depending on the asset size and class, so certainly on larger assets, we would tend to put a sensor on the motor driven there in the motor, non driven bearing plus either one or two pump bearings if we've got access to those.

**Ben Tam, Isle Utilities** 1:15:49

Okay. In the interest of time, it might be some questions on there, feel free to to dive in and answer those yourself. And we'll we'll try and round up to people as well. Thanks, Paul. I think Yeah, again, this was pretty clear. There were years of asking to the sector. So thanks for being here with us. Thanks. Thanks, everybody. So we're down to the last presentation today. Good to know is not it's not the very end, and it was 78 people still alive, I think about 81 at the top. So pretty great. Everyone's still here to hear from field. And I'll hand over the floor to my choice field, actually.

**Ross Damerell, FLYD Ltd** 1:16:30

It's me, Ross.

**Ben Tam, Isle Utilities** 1:16:31

Hey, Ross. Thanks for coming along. No problem. I have over to you floor is yours format.

**Ross Damerell, FLYD Ltd** 1:16:40

Brilliant. Thanks, Ben. Thanks for having me. And thank you to all the other speakers today. My name is Ross and I head up the commercial side here at field. So field was born out of collaboration between Boston Consulting Group otpp, Cora and sGm. So as GM, we're looking for ways of improving worker safety, streamlining processes, and removing some of the key frictions utility companies face on a day to day basis. So this is why we were developed. Initially, the solution was focused on improving safety and productivity. But the knock on effect we found is that by streamlining these processes, there's reduced strain from regulatory pressure and public expectation. And next slide, please. So in terms of the key frictions that were identified, during the discovery phase, they were focused around two key areas which was field workers and managers. on the field worker side, we found there's a considerable amount of time was being spent on paperwork, which slowly was becoming more of a tick box exercise than anything, then oftentimes, workaround solutions like text messaging, or WhatsApp are also being used, meaning data has been stored in lots of different places, and when problems do arise, it can be a nightmare trying to locate all the necessary information. We then found repeatedly that job logging and risk assessments being completed at the end of the job when people are rushed or forgotten key elements. And this was frequently happening on smaller jobs where experienced field workers felt a risk assessment wasn't deemed as necessary or as important. So moving on to the manager side, we found that there was limited capacity for managers to visit every site resulting in it becoming increasingly difficult to keep workers safe from a distance. Managers also didn't have all the data to be able to make informed decisions or identify what issues are common, making it hard to anticipate problems that may come up on site. Without this data is difficult to organize their day or prioritize their workloads. As historically all of this information is stored on paper and never captured in systems. Next slide, please. So that's why we came in as a top level overview of the platform field enables effortless data capture for visual risk assessments, and allows real time visibility of site activities. The AI based platform pulls unstructured data from recorded videos and creates a risk assessment alongside recommended controls associated with these risks. So what started out is predominantly safety focused all as developed and have wider benefits around productivity and streamlining operational processes. And that's the key as to why we're different. Some alternative solutions recreate paper forms, resulting in the same inefficiencies and issues but with field work as a safety conscious before starting a job, and managers can monitor this allowing remote collaboration amongst teams. This data is then fed back into the field platform, surfacing actionable insights, allowing managers to focus on improving operations, while still minimizing risk. So these are the initial improvements. But the secondary benefits that are gained from this allow companies to transform their core operations enable remote collaboration, and especially in times of COVID reduce the need for face to face contact, whilst also exploring ways of optimizing processes deeper and ultimately providing a better service for the end customer. Next slide, please. So in terms of the work we've been doing with STM, we've seen some impressive benefits over the initial seven months together from both safety and productivity point of view. So we're now embedded in all 14 investigations Depo is across the country have been used in nearly 14,000 jobs since rollout these benefits include a 36% improvement in safe days 89% of jobs being completed faster, and safer and over 6000 pieces of paper being removed from the process. The indirect impacts of this has enabled sGn to continuously improve their ways of working was also increasing the span of control between managers and field workers. And next slide please. So this quote from sGn co highlights the implementing field has benefited the entire company and its customers, not just the field teams, and the ultimate benefits the end customers are saved for constant supply, resulting in increased satisfaction and reduced costs. Next slide, please. So, why are we presenting here today, we've already developed wsdm within the gas industry and now making our first moves into water. Initial feedbacks been positive, but we're looking for partners within this industry to help tailor the field technology to deliver these same benefits. We would start with an initial scoping whereby we work together to identify any water specific changes that need to be made, then beginning an initial pilot, where we work closely to drive adoption and gather intelligence, and finally optimizing the process to deliver tangible improvements to you and your companies. Next slide please.So that's it. Any questions from anyone now but thank you for having me.

**Ben Tam, Isle Utilities** 1:21:06

I hope it was interesting. As well as wrap this up. Well, they're kept on time. Thanks for great presentation to round out today as well. I'm glad everyone has managed to stay with us till till till the very end of 530