

Response to Ofwat's emerging strategy: Driving transformational innovation in the sector

Organisation: UK Water Industry Research (UKWIR)

UKWIR has been positively shaping the UK water industry's future for over 25 years. We facilitate, manage & deliver a strategic programme of research projects for our members, the water companies of the UK and Ireland, to address the key challenges they face. We do this by providing leadership in shaping the future water research agenda.

Members benefit from collaboration on research projects of common interest and elimination of duplication in research, enabling them to get more value for their investment. UKWIR maintains a robust programme of stakeholder engagement to help deliver the optimum programme.

Our members have access to the highest quality independent scientific and strategic research to address the challenges they face in their everyday operations, now and in the future. The innovations that will come out of the research carried out by UKWIR will help to meet future challenges, such as those arising from population growth and climate change. It is also important that this research helps companies to continue to provide their customers with a secure and high quality service, at the lowest possible cost, whilst minimising any impact their operations have on the environment.

The organisation and administration of collaborative work can be a significant barrier. Getting agreement from all parties on contractual terms and Intellectual Property Rights (IPR), for instance, can take some time and effort. We have found that our members particularly welcome the role that UKWIR plays in this by managing, procuring and delivering the research on their behalf.

UKWIR has developed 12 Big Questions to tackle the key challenges faced by the industry, now and in the future. These were identified through extensive consultation and discussion with our members and their key stakeholders. They are widely supported and form the basis of our strategic programme of research.

We would like to express an interest in attending any further workshops convened by Ofwat to develop these proposals further.

If you would like to discuss any aspects of our response in more detail please contact Steve Kaye, UKWIR CEO:

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Executive Summary

- We consider that the £200 million allocation of money to a central fund to stimulate innovation is appropriate and is broadly in line with the paper put forward by WRSE on behalf of a number of organisations, including UKWIR, which proposed a model that would enable the sector to address important gaps in its current approach to innovation with wide ranging intergenerational benefits for customer, society and environment. It is important that this investment delivers transformational change and true value. Robust but not overly onerous assessment of these aspects needs careful consideration and design.
- Making the mechanisms time limited to the 2020 to 2025 period may stifle projects that will straddle more than one AMP and may not deliver the innovation needed to address longer-term issues. Projects should be considered on the benefits of their potential outcomes rather than be constrained by investment cycles.
- Competitive benchmarking of costs and performance is a necessary part of the regulatory regime but in order to incentivise the collaboration needed to drive sector-wide innovation that benefits all UK consumers we may need to value a broader set of criteria than simply financial cost. Valuing the benefits to social and environmental capital is equally as important. The introduction of a mix of binary and non-binary targets, particularly related to longer term issues, would help to address this.
- Collaboration between companies and regulators to progress transformational innovation is critical and must be a key principle underpinning all projects that are centrally funded.
- The decisions made by the independent entity must be fully transparent and a robust and independent governance process should be in place.
- The proposals and our response are also supported by water companies who are not currently in line to benefit from the fund directly, i.e. Scottish Water, Northern Ireland Water and Irish Water. They believe that links with the Scottish and Irish innovation delivery vehicles, such as Hydro Nation and BlueTech, will help the UK take a more joined up approach.
- There are a number of credible organisations currently operating in this innovation space and here lies the opportunity for greater levels of collaboration. These organisations all have something different to contribute to the innovation process and such an initiative could be the catalyst that is required to generate more cohesion and collaboration.
- Building on the suggestions made in Section 4 of the consultation document, we present a potential framework for a collaborative, sector-based innovation organisation in the **Appendix** to this response.

Q:1 What are the main barriers to innovation in the sector and why?

Innovation in the water industry has tended to be more incremental and small scale; with collaboration between companies and implementation of new tools and techniques often being limited. The sector is facing a number of significant challenges and we support Ofwat's, and indeed the industry's, ambition to drive transformational change in the sector and agree that it is time to take a more radical approach to ensure we deliver the best outcomes for customers, society and the environment.

UK Water Industry Research (UKWIR) is the water industry's research body and drives a collaborative approach to research across the industry and the evidence to drive change. This is a critical pre-cursor to innovation. In our experience of working closely with water companies, the barriers to more transformational innovation include:

The Operating Environment

- The drive and incentives to innovate has been less when compared to industries in more established competitive markets. This can be seen in the amount water companies invest in innovation/research and development compared to other sectors. Typical investment by the water industry is < 1% of turnover while more competitive industries, such as pharmaceuticals and IT with higher rates of return, typically investing > 10%.
- Vertically integrated monopolies can suffer from assuming their services are efficient and in finding the right balance between risk and effectiveness – in reality this is not tested in a market environment.
- The nature of the asset base - the need for the continued operation and maintenance of ageing assets, coupled with a regulatory framework that involves separate opex and capex efficiencies comparisons has historically resulted in high capex investments to create new assets. The introduction of totex is helping to redress this balance and will be critical to drive higher levels of innovation in the area of asset optimisation and maintenance.
- The nature of the data – it is true that the industry has large amounts of valuable data, however, the challenge of providing robust and symmetrical datasets should not be underestimated. Companies use many different systems and data criteria which makes creating unified datasets a significant challenge that takes time and effort. We have experience of this in creation of the UKWIR National Mains Failure Database for water mains and sewers. Certain datasets may also be sensitive and not suitable to be made visible and accessible to all.

The Regulatory Environment

- The short-term nature of the investment cycle, the five-year AMP cycle, has propagated short-term thinking and the need for 'quick wins' so benefit can be realised within the AMP period with there being little incentive to think further ahead and invest in solutions for the longer-term.

- Many innovations, particularly those which involve more nature based and or control at source solutions, also require regulators to be part of the changes as policy and/or regulations need to be updated to facilitate improved services and ecosystem resilience. To date with nearly all environmental controls being driven from the EU, it has been difficult for regulators to be as involved as they would like in jointly working with the sector to drive change.
- Comparative performance benchmarking – The water sector faces significant challenges which could be more effectively addressed through collaboration to deliver the best outcomes for all consumers and our environment. Competitive benchmarking of costs and performance is a necessary part of the regulatory regime but may reduce the incentive for collaboration if companies want to 'top the table'. Therefore, a different approach is needed to incentivise the collaboration needed to drive sector-wide innovation that benefits all UK consumers. This may need us to value a broader set of criteria than financial cost, including valuing the benefits to social, and environmental capital in our decision making.
- Binary performance targets – the use of binary targets, particularly related to performance commitments and ODIs could be limiting the industry's appetite to innovate due to fear of failure - resulting in targets being missed and financial penalties being incurred. As companies' aspirations increase, so will their reliance on innovation but it must be recognised that not all new ideas will work and that failure is acceptable as long as it is recognised quickly, and we learn from it. The introduction of a mix of binary and non-binary targets, particularly related to longer term issues would help address this.

The Risk Environment

- As recognised in the consultation document, the industry has clear public health and environmental obligations to deliver and this can result in a lower risk appetite than seen in other sectors. It also makes testing any new innovations in a 'live' environment very challenging.
- The culture of public service and 100% compliance, still pervades the sector, which while being beneficial to a spirit of doing the right thing, can work against taking risks. This can be exacerbated by regulators use of language and various incentives around service failure, which often serves to justify risk aversity.

The barriers can also limit market opportunities for innovative companies in the supply chain, often resulting in companies having higher success rates overseas where the barriers to innovation are considered less. For example, digital platforms to smart water networks.

There is also a common view that the water sector in the UK is highly fragmented with insufficient coordination limiting the level of innovation. On the other hand, too much central control can indeed stifle innovation. A balanced approach which includes a range of benefits to society, the environment and the economy from

any new body managing 'once voice' innovation for the sector should be considered when moving forward.

However joint working and sharing does operate around the fringes through trade associations and vehicles set up for collaboration such as UKWIR.

Finally, management and Intellectual Property Rights (IPR). The organisation and administration of collaborative work can be a significant barrier. Currently one company usually takes this on for the benefit of others involved in any collaborative work. Getting agreement from all parties on contractual terms and Intellectual Property Rights (IPR), for instance, can take some time and effort. We have found that our members particularly welcome the role that UKWIR plays in this by procuring, managing and delivering the research on their behalf.

Q:2 Do you think that the financial support cited in section three is required to stimulate innovation in the sector? If so, what do you believe is the appropriate amount of funding and why?

We consider that the £200 million allocation of money to a central fund to stimulate innovation is appropriate and is broadly in line with the paper put forward by WRSE on behalf of a number of organisations, including UKWIR, which proposed a model that would enable the sector to address important gaps in its current approach to innovation with wide ranging intergenerational benefits for customer, society and environment. The paper suggested £35m pa would enable the right balance between value and significant progress and is broadly comparable with the Ofgem Networks Innovation model.

This funding would be in addition to the money companies individually invest in innovation/research and development and would be targeted at the transformational, industry-wide opportunities that benefit all consumers and the environment. It would enable particular focus on supporting the end-to end process and the scaling up of ideas, which is often where proportionally higher levels of funding are needed and has often been a limiting factor to widespread benefits being achieved. How the innovation is then implemented and used within companies to benefit their individual customers is where comparisons can be made.

Considering that current R & D budgets for individual water utilities are typically between £0.5m & £5m per year (note mainly the larger WASCs), a central fund of this scale would certainly allow projects to be properly researched, trialled and proven at scale. It would also allow end to end innovation, including the progression of new ideas, research, trialling innovative solutions at scale and creating clear and credible business cases to support successful roll out across the industry.

It should, however, be noted that the ratio of funding required from development of an idea to deployment has been estimated at 1:10, i.e. a £7m project could take £70m to implement.

Q:3 Do you agree that our proposed draft principles for additional financial support will effectively safeguard the interests of customers?

We are broadly in agreement with the principles proposed by Ofwat to safeguard customers' interests. Other regulators will also want to make sure that innovation also benefits and safeguards the environment.

We fully support the principle that companies will need to provide evidence of how they are working together and with others, and a commitment to sharing of progress and findings as this is the change in behaviour that the new approach could and should most influence, given the unique challenges the sector faces. The incentivisation of collaboration in research and development/innovation and scaling this up will be key to transformation.

As highlighted in our response to Q1, the short-term approach typically results in incremental innovation. For this fund to be truly transformative it must have significant focus on longer-term issues that have the potential to benefit all consumers, and support greater ecosystem resilience. The benefits to customers and/or the environment must be transparent and measurable and each project must be considered against a range of success criteria that covers factors including service improvement, cost efficiency, increased resilience, environmental enhancement, natural and social capital.

In view of this we do have concerns that by making the mechanisms time limited to the 2020 to 2025 period, we may stifle innovation projects that will straddle more than one AMP and it may not deliver the innovation needed to address longer-term issues. Further consideration needs to be given to achieving a seamless transition between AMPs to enable a longer-term focus and reduced uncertainty.

Another principle that we consider should be included is the avoidance of duplication. The fund should only support projects that are not being progressed elsewhere and are genuinely unique. This will ensure that customers' money is used as efficiently as possible.

We welcome Ofwat's recognition that innovation projects will not always deliver a successful outcome and we agree that safeguards need to be put in place to protect consumers. However, unsuccessful projects can provide significant learnings that can be shared and help to avoid further unnecessary investment. The "learning from failure" approach is one that is used successfully in some of the most innovative industries such as Formula 1. Therefore, when considering when and how much money is 'clawed back' through the reconciliation process, a thorough assessment must be made of the learnings that have been shared and the avoided costs that the unsuccessful project has contributed to for the wider industry. The inclusion of a 'claw back' principle may also have unintended consequences as it could drive 'safe' rather than 'transformational' projects.

Whilst the 'open by default' approach is admirable and should be the aim, this will require significant effort to achieve (for the reasons outlined in our response to Q1).

Q:4 What are your views on the collectively funded innovation competition model which we describe in section three? What other key considerations not highlighted should we take into account in designing/ implementing the competition?

Centralised innovation, provided it is expansive and inclusive, will stimulate collaboration resulting in more transformational innovation. Successful roll out will ensure more positive outcomes for customers and help address the barriers identified in question one.

This approach gives companies the opportunity to access a larger pot of funding and should achieve the following outcomes:

- Independence and accountability
- Inclusivity
- Scale
- Collaboration

Collaboration between companies and regulators to progress transformational innovation is critical and must be a key principle underpinning all projects that are centrally funded. Therefore, the use of a competition model must not be a further barrier to the collaboration that is essential to drive innovation, but instead act as an incentive for the companies to work more closely in developing a high level, long term focused, sector-wide innovation strategy that will identify those projects that are put forward for central funding. How this could be achieved is covered in our response to Q7.

Running the competition annually may limit the number of good ideas coming forward to the expert entity. An alternative may be submitting ideas on a quarterly basis, or allow for continuous identification of opportunities, particularly as momentum increases. This would encourage a fail fast, and test and learn cycles and move on culture and optimisation of resources. It would also allow for leverage of external funding and research as opportunities present themselves, and innovation becoming a cultural norm embedded in day to day practice.

UKWIR is driving its strategic research programme through 12 Big Questions which is successfully helping the sector to prioritise its research projects in the context of delivering ambitious, long-term improvements. They are enabling the sector and organisations such as regulators, stakeholders, the supply chain and the research community to coalesce around the key issues and provide a platform to deliver the evidence to drive transformation. There could be value in considering how this approach could be adopted or aligned within the framework underpinning the competition. Not least because research is a critical step in the process that drives innovation.

The key is in the orchestration of activity that ensures all investment within and outside the sector, both within incumbent water companies, research institutions and technology companies is leveraged.

We fully support the proposal that companies are involved in developing the detail of the framework. The decisions made by the independent entity must be fully transparent and a robust and independent governance process should be in place.

In addition to the points identified in the consultation we consider there needs to be a high level of rigour around the co-ordination and delivery of projects and the entity's role in monitoring and reporting on this should be incorporated within it. The return on investment is important but societal and environmental benefits should also be valued.

The membership of the panel itself must contain the right mix of expertise, and include relevant regulators to ensure any innovations which require regulatory or Policy change to enable them, can tackle place in parallel. This is particularly true for nature based solutions. Given the broad nature of the industry's work and wide range of projects that are likely to be put forward this may be best served by a core group of innovation experts supplemented by a pool of subject matter experts who would be chosen depending on the nature of the project.

As mentioned earlier we do have concerns about the funding mechanism being limited to the 2020 to 2025 period as it may limit commitment to longer term projects. We also caution against leaving a review until the end of the 2020 to 2025 period as it could create uncertainty about the future of the fund. Instead we consider a more continuous approach to reviewing the effectiveness of the fund should be adopted, while recognising that benefits may not be achieved immediately and in some cases take some time to be fully realised.

Finally, as outlined in our response to Q1, the organisation and administration of collaborative work can be a significant barrier. Currently one company usually takes this on for the benefit of others involved in any collaborative work. Getting agreement from all parties on contractual terms and Intellectual Property Rights (IPR), for instance, can take some time and effort. We have found that our members particularly welcome the role that UKWIR plays in this by managing, procuring and delivering the research on their behalf.

Q:5 What are your views on the end-of-period innovation roll-out reward we describe in section three? What other key considerations not highlighted (e.g. whether it should be collectively funded or individually funded) should we take into account in designing/ implementing the reward?

We agree with the principle of rewarding the adoption and implementation of innovation, this could be achieved in several ways including some existing regulatory reward mechanisms. It is at this stage in the innovation process where companies are likely to work more independently, tailor implementation in line with the specific needs of their customers and measure the benefits achieved. It will also enable Ofwat to make a comparative assessment of companies across the sector and take account of this in future price review determinations.

However, it is important that this approach does not disincentivise companies to share their learning and experiences associated with adoption and implementation and instead reward companies for working in isolation. Collaboration would result in more widespread exploitation of innovation across the sector. The reward for knowledge sharing is therefore key and this type of behaviour should be greatly incentivised and rewarded.

We recognise the risks identified by Ofwat in the consultation document. Considerably more scrutiny of the work being undertaken by companies and the funding used to progress and implement innovative solutions would be required, alongside rigorous assessment against a set criteria. Clarity is also needed as to whether the end of period reward can be applied to innovations driven through the competition.

However, it does provide an opportunity to help an innovation through the 'valley of death' i.e. when a good idea is blocked by perceived risk, company culture, etc. Reward should reflect the successful development of wider inclusive markets for products and services that will endure as innovative spaces for established providers as well as start-ups. Rewards would greatly help to incentivise companies to internalise risks of a 'fail fast' approach so that risk is primarily borne by those who can most afford and benefit from it.

The governance framework could be similar if not the same as for the competition, especially if the 12 UKWIR Big Questions were used as the priority challenges and strategic framework for the sector.

Q:6 What other potential alternative mechanisms for funding/ rewarding innovation not discussed do you think we should be considering? Which financial support mechanism or combination of mechanisms should we introduce and why? What would be an appropriate split of available funding/ reward?

Our thoughts on an appropriate split of available funding/reward:

Due to the essential role the water sector plays in society, the significant challenge it faces and the ambition for transformational change that benefits all consumers, the majority of the fund should be allocated to fund innovation as this is where there is most opportunity for collaboration and knowledge sharing within and beyond the sector.

Also, the costs of running the competition and the support needed to co-ordinate and deliver activity should not be underestimated. Bearing in mind the importance of collaboration and knowledge sharing, the proportion of the reward element associated with successful adoption should be weighted in favour of this to avoid rewarding companies for working in isolation.

A higher proportion of the funding should be centralised to ensure the overall benefits previously mentioned in the consultation document.

Considering these points, the following funding allocation is suggested based on £40m being available per year (although the annual allowance could start smaller and increase as the process beds in):

- £30m - Allocated to companies through the competition
- £9m - As an end of period reward to companies (weighted more towards the sharing element). This could be delivered via other regulatory reward systems, i.e. those that reward service improvement.

- £1m - To run the competition and the delivery organisation (see our response to Q7).

Other areas companies can be rewarded for transformational innovation are as follows:

- Development of wide reaching and enduring markets to sustain innovation and opportunity
- Supporting start-ups and SMEs deliver new ideas to the market
- Helping universities convert research into impactful innovation
- Transferring innovative solutions from overseas

Q:7 Do you think the potential industry activities discussed in section four could help drive innovation? Are there other activities not identified which you think the industry should be considering?

There is more that the sector can do to promote innovation and to drive innovation. It is important that any action companies take complements the funding approach proposed and maximises the opportunities associated with it.

Ofwat rightly identifies the need to streamline existing initiatives to ensure that efforts are complimentary rather than duplicative. In particular we consider there needs to be a greater level of co-ordination across the end-to-end process, incorporating the competition as the source of funding, for the industry-wide, transformational projects that are the target of this new approach.

In its consultation, Ofwat highlights the opportunity for a sector-wide innovation strategy to help prioritise and focus industry efforts and provide transparency for the supply chain and innovators. This would also help identify which industry challenges should be addressed by the innovation competition – helping to avoid competition between companies and reducing barriers to collaboration. For example, UKWIR’s 12 Big Questions could be used as a strategic focus for innovation. Alignment with the framework for financial support will help ensure a clear line of sight between sector priorities and allocation of funding.

It also puts forward the idea of establishing a water centre of excellence to support delivery of the chosen innovations. We see value in both of these suggestions but the process – from strategy development; to competition bid prioritisation and development; to delivery of successful projects; to benefits realisation and implementation – needs to be highly co-ordinated and underpinned by strong governance. This could be achieved by collaboration between an existing number of organisations coming together under a set of common principles (see Appendix, Fig 1).

In particular, links with the Scottish and Irish innovation delivery vehicles, such as Hydro Nation and BlueTech, will help the UK take a more joined up approach.

The ‘open by default’ approach to data – the aim of providing robust and symmetrical datasets is commendable but should not be underestimated. Companies use many different systems and data criteria which makes creating unified datasets a significant challenge that takes time and effort. We have

experience of this in creation of the UKWIR National Mains Failure Database for water mains and sewers. Certain datasets may also be sensitive and not suitable to be made visible and accessible to all.

Building on the suggestions made in Section 4, we present a potential framework for a collaborative, sector-based innovation organisation in the **Appendix** to this response.

Q:8 Do you think the proposals in section five will help drive innovation? Are there other activities not identified which you think Ofwat should be considering?

The proposals identified in section five are certainly welcome and should help to drive innovation. However, some more radical changes may also be required.

The short-term nature of the investment cycle – the five-year AMP cycle has propagated short-term thinking and the need for ‘quick wins’ so benefit can be realised within the AMP period with there being little incentive to think further ahead and invest in solutions for the longer-term. The current five-year investment cycle can therefore be a significant barrier to innovation. If longer term targets for improvement and investment could be set then this would make space for more innovative solutions to be sought, tested and implemented. It may also help the industry move towards more ‘no regrets investment’.

There have already been some good examples of how this could work such as the implementation of catchment management solutions and the Chemicals Investigations Programme. It takes many years to fully realise the potential of catchment management solutions, it has also taken a change in quality regulation approach to allow for such solutions (and for the possibility that they may not be successful). The Chemicals Investigations Programme has been a good example of companies, regulators and suppliers working together to explore what the best solutions may be instead of setting short term improvement targets that are unachievable and unsustainable if current technology has to be employed.

The Environment Agency has developed a ‘trial permit’ for certain regimes to try and help to enable innovative process to be trialled on live sites, similar powers and trialling regulatory approaches also operate in Wales. However, this approach needs some further thought to ensure it does not become a barrier. Requests can take a long time and significant effort (resource and cost) to be authorised. (<https://www.gov.uk/government/publications/regulating-trials-of-waste-management-operations>). It may also be worth seeking the views of those who have used the DWI’s ‘Materials in contact with drinking water’ approvals process.

Regulatory certainty cannot always be offered for innovative solutions, so the regulatory framework needs to specifically acknowledge and allow for this (in as

safe a way as possible). A 'can do' rather than a 'must not do' attitude needs to be adopted by all involved.

Setting up the right 'risk and reward' mechanism is also key. There needs to be 'carrot' not just 'stick'.

As previously mentioned in our response to Q1, thought needs to be given to comparative performance benchmarking – The water sector faces significant challenges which could be more effectively addressed through collaboration to deliver the best outcomes for all consumers. Competitive benchmarking of costs and performance which is a necessary part of the regulatory regime may reduce the incentive for collaboration if companies want to 'top the table'. Therefore, a different approach is needed to incentivise the collaboration needed to drive sector-wide innovation that benefits all UK consumers

Binary performance targets – the use of binary targets, particularly related to performance commitments and ODIs could be limiting the industry's appetite to innovate due to fear of failure - resulting in targets being missed and financial penalties being incurred. As companies' aspirations increase, so will their reliance on innovation but it must be recognised that not all new ideas will work and that is acceptable as long as it is recognised quickly, and we learn from it. The introduction of a mix of binary and non-binary targets, particularly related to longer term issues would help address this.

Appendix

Potential framework for a collaborative, sector-based innovation organisation

We consider there is an opportunity for a new or modified independent, sector-based organisation to deliver this end-to-end process, which will not only drive collaboration across the water companies but also across the organisations that already work in this space.

A critical part of the development and delivery of a high level innovation strategy (so as to compliment those already in place within water companies) will be connecting the many organisations that contribute to different parts of the process. This will require a central co-ordinating body that incentivises organisations to collaborate and creates greater synergies between them, see Fig 1 for a diagram of the organisations operating across the sector.

Following publication of this consultation, UKWIR held a collective discussion with a number of organisations including WRc, British Water, Future Water Association, Cranfield University, Sheffield University and Isle Utilities, all of whom have committed to progressing a more collaborative approach to maximising the opportunities associated with the innovation fund and supporting delivery of the chosen projects. Discussions are underway to establish how this could work in practice and to seek support from water companies. We would welcome the opportunity to discuss this further with Ofwat.

We suggest the following 11 key principles that such an organisation would work by:

- Independent
- Expert-led
- Addressing short, medium and long-term challenges
- Open innovation culture
- Collaborative and supported by regulators
- Knowledge sharing
- Transformational
- Avoid duplication
- Outcome focussed
- Rewards innovation and collaboration
- Learn from failure.

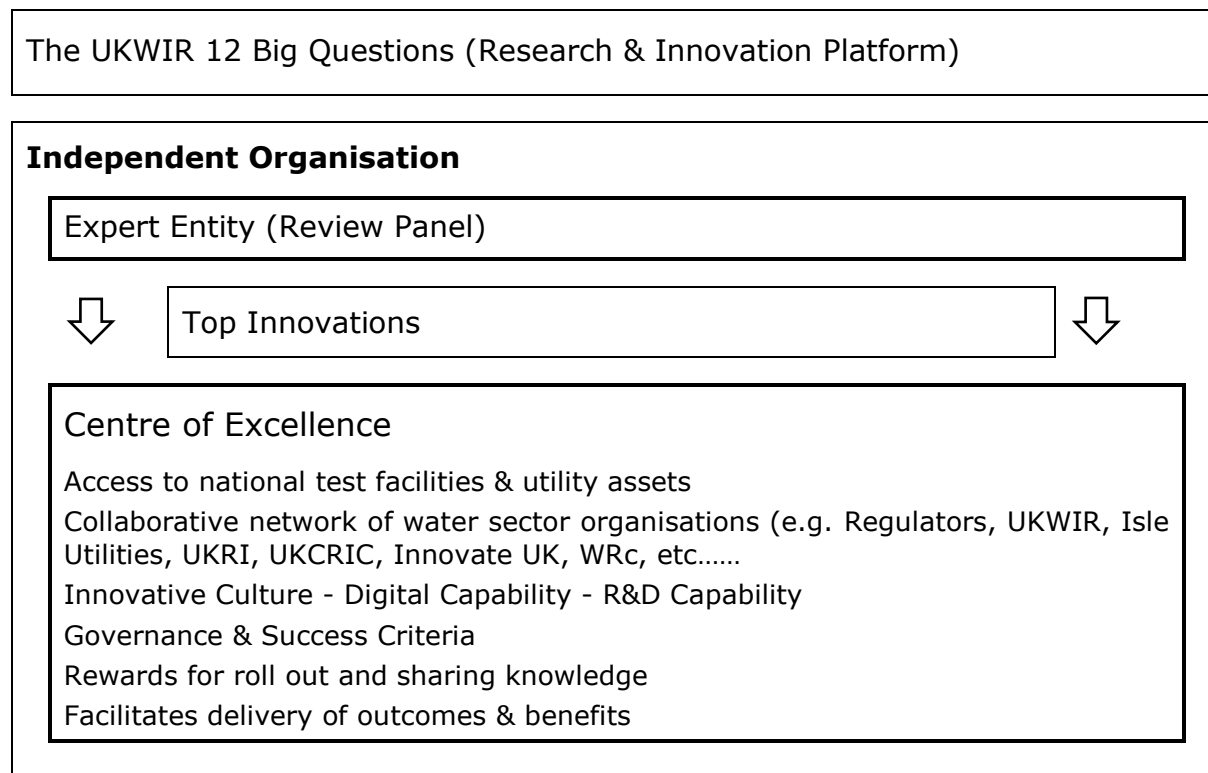
As mentioned in our response to Q4, UKWIR has established 12 Big Questions to support the delivery of its strategic research programme that is addressing long-term challenges being faced by the UK industry. This has received a good level of support from the sector and is effectively increasing collaboration associated with the prioritisation and delivery of research.

There is a clear link between research and innovation so the Big Question platform could be further developed to incorporate the identification of innovation within it and form the basis of the sector-wide innovation strategy, the framework for the competition and organisation of delivery.

A small but strong centre of excellence would be required to manage and monitor the process, drive and support progress and ensure accountability for innovation initiatives. The role of this team would go far beyond process management, it would require a diverse and specialist range of skills including financing and funding expertise, digital capability, R&D and change management to support the end-to-end process. In addition, this team would ensure accountability of funding investment and tracking against clear success criteria for the Expert Panel/Board.

The centre could co-ordinate access and links to facilities nationally and internationally so we can maximise knowledge sharing and respond quickly to developments elsewhere. In particular, links with the Scottish and Irish innovation delivery vehicles, such as Hydro Nation and BlueTech, will help the UK take a more joined up approach.

The following diagram sets out how this could be organised.



Prioritisation and Allocation

The Chair of the Expert Panel/Board would be appointed by and be accountable to the Ofwat Board. Annually the Chair of the Expert Panel/Board, supported by the Centre of Excellence, would set out and agree the priorities for future innovation investment and report on benefits achieved against the agreed success criteria to OFWAT.

Data sharing

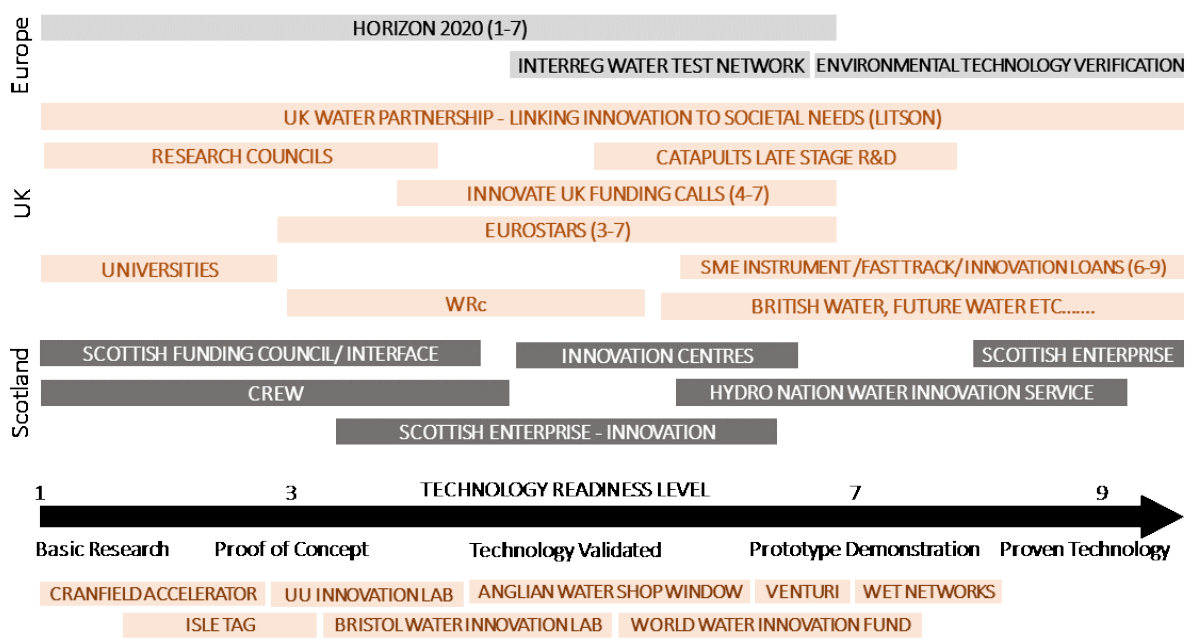
There is opportunity for significantly more data and information sharing and to improve the insight gained from data through the establishment of a central collaborative platform. Companies who wish to benefit from and contribute data

to such a platform would be able to subscribe and it would be managed centrally. Solution providers can subscribe, utilise the data and share the results. The platform would be potentially open globally, dependent on the data. Data sharing controls will need to be developed to protect any commercial IP, or potentially sensitive data. See Fig 2 for a diagram of how a data sharing platform could be organised.

As mentioned previously, the challenge of providing robust and symmetrical industry datasets should not be underestimated. Companies use many different systems and data criteria which makes creating unified datasets a significant challenge that takes time and effort. We have experience of this in creation of the UKWIR National Mains Failure Database for water mains and sewers. Certain datasets may also be sensitive and not suitable to be made visible and accessible to all.

Fig 1 below shows examples of organisations currently operating in the sector. These organisations all have something different to contribute to the innovation process.

Fig 1: Organisations currently operating in the sector



Courtesy of Arup (2019)

Fig 2: Data sharing platform

