

Environment, Food and Rural Affairs Committee

Regulation of the Water Industry Inquiry

Written evidence by the Chartered Institution of Water and Environmental Management

Background to CIWEM

1. CIWEM is the leading independent Chartered professional body for water and environmental professionals, promoting excellence within the sector. The Institution provides independent commentary on a wide range of issues related to water and environmental management, environmental resilience and sustainable development.
2. CIWEM welcomes the opportunity to respond to EFRA on its inquiry on the regulation of the water industry. This response has been compiled with the assistance of members from across our diverse range of technical expertise, encompassing water resources, supply and quality, wastewater and bioresources, natural capital and flood risk management.

Summary

3. Regulation of the water industry is improving outcomes for customers and the environment with improved levels of service to customers, improved resilience and less pollution incidents. Performance commitments and outcome delivery incentives appear effective in driving such improvement.
4. Despite this, it is considered that there are areas where the industry should be regulated to deliver more extensive improvements. These relate to issues such as increased rates of water main and sewer rehabilitation and replacement, reduction in the number of serious pollution incidents and combined sewer overflow discharges, reduction in levels of leakage from the supply network and improvements on water efficiency, including through more widespread metering. The industry should also be enabled to manage surface water more effectively through greater capacity to adopt and maintain multifunctional sustainable drainage systems.
5. After almost thirty years since the industry was privatised, CIWEM considers that current models of ownership and regulation of the industry should be independently reviewed in the context of their suitability to meet the requirements of both customers and the environment in future decades. This should examine the range of performance of companies throughout the UK as well as overseas.
6. Innovation in the industry is important to successfully meet the varied and extensive challenges posed by climate change, demographic change, environmental

degradation and the need to move towards a circular economy. There remain concerns within the industry regarding the extent to which compliance risk might act as a brake on innovation. Companies should be allowed to innovate and fail and should be encouraged to share knowledge and best practice.

7. The industry has the potential to engage more actively in the management of water at a catchment scale via closer linkages with other regulatory and policy instruments such as a revised agricultural incentive and subsidy regime following exit from the European Union. Given their scale and capacity to plan over long time horizons, water companies have the potential to be able to work in a coordinated and transformational way with farmers at a catchment scale to enable optimal delivery of food production and other public goods such as nature conservation, drought or flood resilience.

Response to inquiry questions

Is regulation of the water industry improving outcomes for consumers and the environment?

8. Most public water and sewerage service provision is inherently a 'natural monopoly' and therefore is subject to significant economic regulation. The economic regulators are responsible for setting limits on pricing (for water and wastewater bills) and protecting customer interests, encouraging competition and investment within the industry. We consider that this is still appropriate.
9. We consider that, generally, regulation of the water industry has improved outcomes for customers and the environment since the industry was privatised in 1989. During that period, about £150bn of capital has been invested, ensuring that the UK's water and sanitation services are amongst the best in the world.
10. The investment undertaken by the industry has been directed by three main regulators: Ofwat, The Drinking Water Inspectorate (DWI), and the Environment Agency (EA) or its equivalent in the devolved administrations. This regulation is intended to deliver water services which are reliable, affordable, safe and of acceptable standards to customers, and which meet the requirements of environmental regulations. At the same time, it is intended to allow efficiently run companies to finance their operations and make a return on the capital that they invest in delivering these services. Consumer body CCWater provides additional scrutiny of the level of service provided by companies to water customers.
11. As a result of these various regulatory drivers, improvements have undoubtedly been made. Levels of service to customers have gone up. The incidence of serious pollution events has reduced. The industry plans its operations to a long-term horizon and thus has a good understanding of its ability to supply its customers, its investment needs, its resilience to drought and to wider climate change (including the vulnerability of its critical infrastructure to flooding). It will soon be required to plan in detail its drainage and wastewater investment in the same way that it currently plans water resources.

12. Performance Commitments and Outcome Delivery Incentives (ODIs) appear to be effective measures for driving (and rewarding) improvement and for penalising underperformance. In their final methodology for PR19, Ofwat state that water companies are required to have comprehensive coverage of their environmental challenges in their bespoke performance commitments. They also state that water companies should consider customer preferences and, where appropriate, impacts on the environment, biodiversity and natural capital when setting their performance commitment levels and ODIs. We understand that in their business plans for PR19, water companies are taking the concept of natural capital into account, albeit some are more advanced than others in doing this.
13. Water companies also increasingly work in more innovative ways with their customers (both household and non-household) through approaches such as customer challenge groups and through active participation in initiatives such as the Catchment Based Approach. These ways of working can help the industry engage and communicate with its customer base more effectively, and have been driven forward by Ofwat (which has a statutory duty to contribute to sustainable development).
14. Performance on maintaining assets for the longer term could be driven harder by regulators. Research by UKWIR¹ shows that current replacement rates for water mains are comparable with similar European countries, but are significantly below that for sewers. Without increased levels of investment, the study showed that mains bursts and supply interruptions are likely to increase by 20 and 25% respectively, leakage could increase by 40% and sewer collapses and blockages (with resulting flooding and pollution) could increase by 6%. Continuous monitoring of these assets was considered the single best means of mitigating these impacts, but clearly investment levels will need to rise.
15. In the context of Ofwat's sustainable development duty, CIWEM considers that the achievement of environmental outcomes cannot be divorced from the economic regulatory signals that Ofwat sends the industry. Ofwat is increasingly placing importance on environmental outcomes, as is evidenced by their inclusion within common performance commitments and the requirement for bespoke environmental performance commitments under PR19, which we welcome. This is reflective of the level of priority which customers are attaching to environmental outcomes within customer challenge groups. It is therefore important that when Ofwat assesses and grades business plans for PR19, the EA and Natural England are actively engaged with this process to ensure that environmental outcomes set out in the Water Industry Strategic Environmental Requirements (WISER) are adequately reflected.
16. There has been some progress towards encouraging and enabling water companies to adopt sustainable drainage systems (SuDS), which deal with surface water at source, rather than it being conveyed via the conventional surface water drainage network. Challenges around mechanisms for SuDS adoption and long-term

¹ UK Water Industry Research Ltd., 2017. Long term investment in Water and Sewerage networks. 7/RG/05/47

maintenance remains a considerable ongoing barrier to the widespread use of SuDS, which can (via the use of planted features) deliver a range of additional benefits (to water quality, biodiversity and amenity) over and above those provided by conventional drainage solutions. The latest version of the Sewers for Adoption guidance² should improve clarity for companies but is still only applicable to SuDS with certain design characteristics and is not optimised to enable adoption of 'green' SuDS which deliver the optimal range of multiple benefit. There is a need for regulators and Government to work concertedly with the water industry to identify a regulatory solution to the current obstacles, in order to help deliver the Government's stated 25 Year Environment Plan aims around issues such as climate resilience and biodiversity net gain.

17. The introduction of competition into the water industry has provided increased choice for non-household customers, has increased the focus on customer service as well as on additional services like water management and water efficiency. Since April 2008, business water retail in Scotland has been competitive, with non-household customers being able to choose their supplier akin to the energy sector. From April 2017, all non-household customers of water and wastewater services in England (and a small number of the largest customers in Wales) have also been able to choose their retail supplier.
18. Ofwat has recognised that there are potentially significant savings for customers resulting from effective consideration of water trading or third-party infrastructure delivery options (other than an incumbent's own in-house solutions), to meet future water resources and other water and wastewater infrastructure needs and challenges. Similarly it is introducing competition in bioresources (the sludge transport, treatment and disposal part of the value chain), which should lead to more effective integration and optimisation of sludge and energy solutions, for example through anaerobic digestion. It has introduced the Water 2020 framework into the business planning process for companies in England and Wales.
19. CIWEM is supportive of the ongoing exploration of appropriate and balanced competition in the sector, to ensure that bills represent best-value and to ensure service provision is as good as it can be. However, there is a need for significant care through ongoing consultation and dialogue across the industry, to ensure that any future disaggregation or restructuring of the sector does not impact upon the integrated, holistic planning that is so important for sustainable water management. It is critical that, given the socio-economic importance of water supply provision, the responsibility for security of supply is clearly defined within future regulatory models throughout the UK to ensure effective planning, management and response.
20. There are questions concerning the effectiveness of the current abstraction plan. For a significant period of time, there was a recognised need for primary legislation to provide the Environment Agency with powers to revoke certain unsustainable abstraction licences and allow increased optimisation of licences through trading. Due

² <https://www.water.org.uk/publications/policy-positions-and-briefings/sewers-adoption>

to the legislative programme created by Brexit the chances of new water legislation were considered minimal and therefore a more voluntary and regulatory approach has been taken which, whilst it theoretically could achieve results and which proposes measures which CIWEM is supportive of, may fail to achieve the required savings in the longer term without legislative teeth.

21. The cost-benefit and funding for abstraction licence changes also should be made clear. We are concerned that the EA lacks funding for their priority catchment pilots, and resources to quickly process applications for new authorisations for previously exempt abstractions. Government is required to report to Parliament on the progress of the current approach to abstraction reform in the next two years.
22. Additional, strategic level scrutiny by bodies such as the National Infrastructure Commission (NIC) have challenged the industry in areas such as acceptable levels of leakage and per capita consumption (see our response to question 2), though it may be argued that similar challenges were made a decade ago by the Cave Review³ and Walker Review⁴ and progress since has only really been significant in select areas (notably on competition and more recently on reforming abstraction).
23. Ensuring that our use of water is sustainable and resilient, and in the context of delivering the targets set out in the 25 Year Environment Plan (to leave the environment in a better state for future generations) will involve effective, cross-sectoral working against clear and reappraised strategic objectives. Ofwat's Water 2020 framework has gone some way to achieving this. However, environmental and economic regulation arguably still need to be more integrated to enable multi-utility benefits and ensure that sustainability can be delivered across a range of sectors.
24. Over recent years, Ofwat has challenged water companies to focus on total expenditure (totex) rather than capital and operational expenditure. This change is welcome and there has been progress in focus on performance as a result. The temptation within a privatised industry is to grow asset values to demonstrate company strength to shareholders. This had resulted in skewed investment towards capital schemes rather than on maintenance and operational improvements. We would suggest that there is more progress that might be made on this front, as investment in maintenance of assets can still be below that which would optimise asset life and efficiency. Totex will also be important for delivering wider environmental programmes, dealing with challenges at source such as water quality through upper catchment schemes. Improved utilisation of natural capital accounting by companies should assist in demonstrating the book value of such operational activities.
25. There has been criticism from a range of quarters concerning the performance of water companies as monopoly providers of an essential public service. This has often

³ Defra. 2009. Independent Review of Competition and Innovation in Water Markets led by Martin Cave.

⁴ Defra. 2009. Independent Review of Charging for Household Water and Sewerage Services led by Anna Walker.

been set in the context of levels of executive pay, shareholder dividends, debt ratios, or the lack of transparency in relation to company ownership and tax contributions.

26. In this context, questions have been increasingly asked as to whether given such behaviour, customers may be provided with better levels of service and the environment may be afforded better levels of protection and management than is driven by the current approach to regulation and ownership. Such questions were amplified during the last General Election when renationalisation of the industry was proposed by the Labour Party and would appear to have some traction amongst customers.
27. Whether or not such a fundamental change to the industry would deliver improved outcomes for customers, the debate around it indicates that there is a not inconsiderable body of opinion that companies should:
- be required to pay a lower proportion of their profits as dividends to their shareholders and reinvest more;
 - improve their performance in some significant areas including leakage, service disruption (such as mains bursts), water efficiency to improve levels of resilience and service to customers, and
 - deliver improved performance on environmentally damaging pollution incidents, including combined sewer overflow (CSO) discharges.
28. After three decades, it would be right for an independent review to consider the ability of the water industry, as currently configured and regulated, to meet the needs of the environment and society, which are considerably different and in certain contexts more acute to those which existed 30 years ago. Such a review should take the opportunity to examine how water companies are owned, operate and are regulated in the devolved administrations and make recommendations for how the current approach may be improved.

Is the water industry adequately delivering a “twin-track approach” of increasing water supplies and reducing water demand?

29. Broadly the industry does take the approach of both attempting to reduce demand and increase supplies where demand management is not considered to be sufficient. Companies have faced challenges in developing new supply side schemes in the past and this should be enabled somewhat through the forthcoming National Policy Statement on Water Resources. However, it may be argued that progress on demand management has not been very ambitious in recent years, so it is questionable whether delivery may be described as “adequate”.
30. We consider that the “twin-track” term is now outdated as it suggests parallel supply and demand option development. We would suggest that demand management should be the priority focus, supported by resource development where necessary to ensure resilience. Trading and transfers are an important part of this mix and provide the third “track”. Other options which do not neatly fit into supply or demand

categories, such as rainwater harvesting and water reuse should also be considered further.

31. CIWEM would therefore like to see a move towards a more diverse approach to balancing supply and demand (which has also been termed “security through diversity” in Australia), which assesses a full range of options on an equal long term economic basis, taking full cost and benefit account of environmental and social effects.

Demand management

32. We are supportive of the more ambitious challenges relating to water efficiency and leakage reduction set out by Ofwat for the next round of business plans, and also welcome the challenges made by the Environment Agency⁵, National Infrastructure Commission (NIC)⁶ and the Ofwat report on the long-term potential for deep reductions in household water demand⁷. These should go a considerable way to translating through to significant improvements in efficiency and leakage over the medium to long-term.
33. As part of this process of improving performance on demand management, it is important for the water industry to move away from a technocratic view of water resource provision, to better understand and therefore influence consumer water use. The demand for water is driven by a wide range of consumer choices, which in turn are influenced by social, cultural and technological interactions within homes and communities. The demand for water cannot be understood in isolation from what people do, and the social and cultural drivers of these practices.
34. When it comes to water use, there are interdependencies between behaviour and technology, best exemplified by the emergence of showering in preference to bathing. Water resource planning needs to involve social scientists and behavioural economists to better understand these drivers and how to influence consumer choice. Wider regulation needs to identify levers to enable progress to be achieved by water companies, for example standards and requirements or incentives to improve the uptake of water efficient fittings and appliances.
35. There is also a need to move away from the analysis and use of average consumption as an indicator and measure of water use. The typical distribution of consumption

⁵ Environment Agency 2018. State of the Environment: Water Resources
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/709924/State_of_the_environment_water_resources_report.pdf

⁶ National Infrastructure Commission 2018. Preparing for a drier future: England’s water infrastructure needs
<https://www.nic.org.uk/wp-content/uploads/NIC-Preparing-for-a-Drier-Future-26-April-2018.pdf>

⁷ Ofwat 2018. The long term potential for deep reductions in water demand. <https://www.ofwat.gov.uk/wp-content/uploads/2018/05/The-long-term-potential-for-deep-reductions-in-household-water-demand-report-by-Artesia-Consulting.pdf>

rates within a population is negatively skewed, with most people using less than the average (i.e. mean) consumption rate. This is inflated by a long right-hand tail to the distribution, which is likely to include leakage (within the home or on customer supply pipes), large households and profligate use.

Metering

36. Evidence indicates that households charged for their water services based on metered consumption use less water than those who pay based on rateable value⁸. Metered households tend to have fewer losses (from leakage) and include fewer properties with very high consumption rates. There are various ways that homes become metered: all homes built since 1990 are metered, unmetered customers can choose to become metered, and water companies can meter existing properties if they are in a region of water stress and metering helps balance supply and demand.
37. Households that have chosen to have a meter tend to opt to save money on their water bill, largely because they have lower than average occupancies and/or consumption. Recently Southern, South East, Thames and Affinity Water have implemented compulsory or progressive meter programmes. A recent publication⁹ on the impact of Southern Water's programme to meter many homes in their area indicates a 16.5% reduction in household consumption in metered homes.
38. There is continuing innovation in meter design with "Smart" water meters able to provide increasing amounts of information about daily water usage as well as throughout the year. These advances provide the opportunity to record greater detail of water consumption patterns and the ability to set new charging tariffs, incentivising customers not to use excessive volumes of water that might be charged at a higher tariff.
39. Ofwat's report on the long-term potential for deep reductions in household water demand indicates that regardless of all the other influencing factors, increasing the proportion of households on a meter will reduce the mean consumption through a range of factors, including:
 - Customers changing their behaviour to use less water or install water efficient devices.
 - Consumption is being measured in most households rather than being estimated.
 - Losses through leakage being identified and repaired.

⁸ Ofwat 2018. The long term potential for deep reductions in water demand.
<https://www.ofwat.gov.uk/publication/long-term-potential-deep-reductions-household-water-demand-report-artesia-consulting/>

⁹ Ornaghi and Tonin (2017): The effect of metering on water consumption – policy note. Ornaghi, C. (University of Southampton), and Tonin, M. (Free University of Bozen-Bolzano), May 2017.

40. Water companies in what are defined as 'Water Stressed Areas' have powers to compulsorily meter and charge on this basis. Most companies in these areas are now using these powers. However, outside such areas, meter penetration remains relatively low, with the average at around 53%. Most water companies have plans to increase meter penetration over time, but this could be undertaken more quickly if legislation allowed.
41. Overall, increased household metering and smart metering will promote greater customer engagement in understanding water use and help to reduce water consumption. This could be enhanced by using innovative tariffs if smart metering is implemented. The increased knowledge gained through metering will support the reduction in both customer and distribution network leakage. This is an aspect of regulation which we consider could both drive and enable the industry to make better progress.
42. Current legislation does not allow for compulsory charging for all customers on a measured basis. Historically this has proven politically unpalatable. However, the benefits of metering as a means of enabling progress on leakage and efficiency are compelling given the need for significant improvements in these areas.
43. We would recommend that comprehensive metering coverage in all water company areas (not just those in seriously water stressed areas) should be permitted, to improve accounting for water use. Improving water efficiency through metering should be a clear aim for all water companies. However, this should also be accompanied by robust schemes to deal with financial hardship and to smooth bill increases for segments of society for which the impacts of moving to a metered supply would be particularly significant.
44. It is important to emphasise that there remain benefits in the installation of meters whether bills are based on metered volumes or not, notably in helping companies to identify and repair leaks.

Reducing leakage

45. The industry has made little progress in improving leakage during the last 5-10 years and leakage can be an obstacle to companies effectively engaging their customer base on issues such as water efficiency when leakage is perceived to be unacceptably high. Water companies have been challenged by Ofwat, the Secretary of State for Environment, Food and Rural Affairs and the NIC to make significant reductions in leakage: Companies have been challenged to reduce their leakage by 15% over the next investment period to 2025. The NIC recently recommended that leakage should be reduced by 50% by 2050, a target which CIWEM is supportive of.
46. Most water meters are installed outside of properties for ease of access and this captures not only water usage but supply pipe leakage and water wastage within the home through leaky cisterns and overflows. Extensive water metering can also help companies assess the difference between the volumes of water entering the distribution network and that being delivered to customers, leading to more accurate estimates of network leakage. This in turn can help target leakage reduction, including

from property supply pipes which are a major source of leakage (supply pipe leakage averages 45l per property per day for unmetered properties, but only 19l for those metered at the property boundary)¹⁰.

Water efficiency

47. In addition to bearing down on leakage, CIWEM considers that water companies should be required to work more concertedly with other stakeholders with the long-term aim of delivering deep reductions in household water use. We suggest that the aim over the next 50 years should be an average per capita consumption of 75 litres per head per day or less. In the short-term this objective can be progressed through specific actions including: reducing losses from customer supply pipes, tackling the problem of leaky loos and reducing or offsetting the additional demand from new development. Action on water efficiency labelling (alongside manufacturers), tightening of Building Regulations and improving the impact of communications would also be beneficial.
48. There is a likely need for stronger regulation to drive progress on activities such as water efficiency and leakage. Projections contained in draft water resources management plans indicate that without a strong regulatory steer, companies remain unambitious in terms of where they envisage reducing per capita consumption (pcc) to. Environment Agency analysis of pcc within draft Water Resources Management Plans shows pcc falling from around 140 l/h/d on average to around 120 l/h/d over 25 years, predominantly as a result of increased metering. Based on indications by Ofwat and NIC, it might be reasonable to suggest that a target of less than 100 l/h/d by 2045 would reflect a more appropriate level of ambition.
49. Ambitious action on leakage and efficiency as major demand management activities should be a focus for strong regulation over the next 25 years. NIC have indicated that near universal smart metering by 2035 would (at worst) be cost neutral, and we consider that this would be a strong enabler for significant progress on these fronts. This in turn would ensure that the need for expensive new water resources would be much reduced, and the water industry would be more resilient to risks associated with climate change and reductions to their abstraction licences.
50. It is important to ensure that the roles, responsibilities and messaging of Defra and the regulators are clearly set out and consistent regarding the funding and promotion of demand management measures. Such consistent alignment will ensure the greatest progress is achieved. In addition, whilst there is much that the water industry can contribute, other organisations with responsibility include local planning authorities, MHCLG (on Building Regulations) and manufacturers of fittings.

¹⁰ CIWEM, 2013. Policy Position Statement on Water Supply Pipe Leakage <http://www.ciwem.org/wp-content/uploads/2016/04/Water-supply-pipes.pdf>

How can innovation be increased in the water industry?

51. Innovative solutions in both management and technology will be needed to solve the long-term issues facing the water industry; they will identify cost and carbon savings and provide a catalyst for sustainability improvements. Regulatory and market mechanisms need to provide the necessary freedom and incentives to encourage the development and uptake of new technology and ways of working. Ofwat's focus on outcomes is a means of enabling this. Low-tolerance, risk-averse regulatory methodologies do little to change the industry's traditional conservatism and reluctance to adopt new technologies and approaches, and have in the past favoured end of pipe "techno-fixes" that are often more carbon intensive. Regulators and the industry need to work as partners to deliver the most sustainable and long-term solutions.
52. In recent years there has been a step change towards risk-based planning for water resources and there is an increasing focus on wider water supply resilience for sectors outside of the core focus of water companies (domestic and business water consumption). This is necessary to develop increased awareness and planning for the needs of other water users, and how best to drive forward efficiency and optimise water use within these sectors (such as agriculture, power generation, industry and navigation).
53. To enable this more integrated approach, there should be planning on a national and regional scale (such as is starting to happen with groups such as Water Resources East, Water Resources South East and Water Resources North) for meeting all future demands for water, not just for public water supply. The Environment Agency should produce an overall water resources strategy for the country to inform such regional partnerships. These regional plans should then iterate to more focused, water company Water Resources Management Plans. Such changes in approach are being reflected in the direction being taken in advance of the next round of water resources management planning (WRMP24) and we consider this to be one of the most innovative areas of the industry currently.
54. There is significant scope to apply innovation in the context of the circular economy within the water industry. Work in the Netherlands¹¹ is demonstrating how water scarcity is a key driver for innovation in relation to water reuse and resource recovery. Here, wastewater is increasingly regarded as a source of renewable energy, raw materials and fresh water. Water authorities are collaborating to develop novel technologies and processes to recover resources from wastewater, to the point that wastewater utilities in the Netherlands and increasingly elsewhere are predicted to become net producers of energy and operate as 'resource factories', producing cellulose, bioplastics and phosphate. In the Netherlands this approach is aided because water utilities are forced by law to commit a certain amount of annual

¹¹ van Leeuwen K., et al. (2018). The Energy and raw materials factory: Role and potential contribution to the circular economy of the Netherlands. Environmental Management. <https://doi.org/10.1007/s00267-018-0995-8>

expenditure to research, correlated to the number of water connections in their catchment area.

55. There has been much made of the decline in research and development (R&D) investment expenditure within the UK's water industry since privatisation¹², with companies typically focused on short term returns and regulators judged on their ability to keep customer prices low, constraining the ability to pass on R&D costs.
56. In general, cost drivers have reduced R&D both internally and externally. It is not uncommon for water companies to place contracts for their capital delivery with contractors who will bear the risk alongside performance guarantees. This is driven by a regulatory emphasis on high levels of service and has the effect of encouraging conservatism, often because the rewards for innovation (a share of gains achieved) are outweighed by the scale of penalty clauses for under-performance.
57. Open data will be important for supporting research. One challenge to innovation is applying research in a transparent and consistent way across all companies in the context of a risk-based planning approach.
58. We believe there would be benefit in work which improves the coordination of how research outputs can be optimally applied to relevant aspects of the industry. Presently, much of the R&D of a common interest to the industry is undertaken by UK Water Industry Research (UKWIR). UKWIR reflects the industry R&D demand, and therefore if financed and briefed to consider more strategic, long-term issues it could be an appropriate vehicle. We would suggest that UKWIR considers implementing the following approaches to its work in future:
- Five-yearly research programmes with stated themes but calls for funding from water companies, industry and academia (comparable to research programmes from bodies such as EPSRC). Funding awarded based on technical criteria by a panel drawn from relevant sectors.
 - Requirement for research to be original and commitment to seek publication in peer reviewed journals.
 - All outputs published and freely available with separate 'streams' for research and guidance.
59. Innovation is of course about more than R&D. It is also about changing ways of working and its greatest impact comes in delivery. External drivers of technological and business model change in society are speeding up the pace of change in the water sector. Industries with some of the best records on innovation and productivity improvement tend to be those with competition, disruptors and a variety of approaches identified by companies, which allows for experimentation and failure.

¹² Environment Agency. A Low Carbon Water Industry in 2050. 2009
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291635/scho1209brob-e-e.pdf

However, the risk of compliance failure can be a significant barrier to the pace of this delivery such that by the time regulatory compliance can be achieved for a new approach, in practice it may be far from new or innovative.

60. Collaboration and improved knowledge sharing are required to rapidly drive forward the commercial applicability of innovative solutions within the industry to the broad dissemination stage. Such an approach would best enable a diversity of approaches to challenges, with a quicker route to adoption of solutions as standard across the industry.
61. Risk aversion within the water industry is understandably widespread. The industry is one which is required to ensure the supply of safe, potable water and sewerage services to its customers and maintain high levels of service, with penalties for failure. It is common practice for water companies to require performance guarantees from their contractors on capital investment schemes. There may be significant penalties for failure, effectively transferring risk over to the contractor. This approach does little to incentivise innovation, and there is a difficult balance for Ofwat to make between actively incentivising water companies to be more innovative in their choice of schemes whilst still requiring the same high levels of service for customers and the environment.
62. It is unlikely that regulators will afford the industry greater flexibility in terms of failure, particularly if there is a real or perceived public health or safety implication involved. However, a move towards more risk-based and dynamic permitting may at least go some way to reduce the temptation to over-treat water.
63. Ofwat's outcomes-based approach to regulation is intended to afford companies more freedom to learn via experience and build it into a more innovative and long-term approach to business planning. The effectiveness of this change in approach is yet to be seen.
64. Natural capital accounting approaches are being developed and increasingly applied to the assessment of environmental impacts of activities and the services provided by ecosystems. Planning and management of water should also adopt such approaches to ensure environmental consequences of management decisions are better considered. The Government should proactively support the development of natural capital accounting through researching and promoting suitable valuation methods as are required. Given the emphasis placed on this approach within the 25 Year Environment Plan, the quicker it can be refined and mainstreamed, the quicker improved incorporation of environmental considerations can be properly reflected in schemes.
65. We consider that the National Policy statement for Water Resources should encourage water reuse equally alongside the other supply-side measures it is seeking to enable. This would help with supporting the use of options such as effluent reuse at a strategic level.
66. We would also suggest that Core Strategies and planning applications should have a bigger water company participation and water companies should be given greater

flexibility in how much they charge developers to connect. This could help ensure the correct infrastructure is in place when required regardless of when it is in the water companies' business cycle (the power to collect monies could also be given to the local councils if deemed more appropriate).

Are penalties and enforcement mechanisms encouraging responsible behaviour?

67. In general, we consider that current penalties and enforcement mechanisms are driving improvements, although there are clearly still issues with unsatisfactory intermittent discharges and pollution incidents occurring. There have been some significant fines and penalties imposed on water companies in recent years for such incidents, or failure to meet leakage targets for example. It remains to be seen how far the scale of such fines is changing behaviour proactively or whether there are instances where a company might consider a significant fine to be a "least worst" option.
68. There has been criticism that the size of even some of the large fines levied at big water companies are miniscule in comparison to their profits. This situation will not help to encourage the public to contribute themselves to addressing challenges in areas such as water efficiency.

Are there any potential benefits for the environment that could be achieved through regulatory divergence post-Brexit?

69. The current uncertainty which exists concerning the outcomes of Brexit, and the resultant alignment or divergence with EU regulation over time following exit make predicting opportunities very hypothetical. In theory there would be potential to rebalance priorities and alter the pace of change around certain areas of expensive incremental improvements at the margins.
70. We consider it important that drinking water standards are adopted that reflect the true health risk and which are based on scientific rigour. The DWI could convene appropriately qualified scientific experts to debate the very latest data on an emerging issue and how to incorporate this into regulations. This could then be circulated for consultation before becoming law as regulations. It would be beneficial for such a process to be highly open and transparent, with all of the data and sides of the debate recorded in a central, publicly accessible register. This would potentially add to the level of scientific rigour and openness that currently exists in the UK and EU, and could help regulation to keep pace with the latest understanding, particularly of emerging contaminants.
71. We would also suggest that water company business plans and catchment management work could be tied directly to agri-environment schemes. A new agricultural subsidy regime focused around public money for public goods, and potentially focused around more coordinated catchment scale working would arguably be more effective with closer water company engagement. Water companies already work actively within the Catchment Based Approach and abstraction management is moving towards a catchment-focused level of operation.

72. Currently there can be a problem with contradictory guidance to water companies and local stakeholders from different business, regulatory and environmental drivers (e.g. agricultural schemes, business needs on crops grown by farmers and what Ofwat will allow water companies to do with customer charges). This can be seen in the Cherwell catchment where Thames Water have spent significant amounts of money working with farmers to reduce pesticide pollution (the voluntary initiative and Natural England also work in the catchment) affecting a drinking water abstraction. However, as oil seed rape farming is still profitable farmers are growing the crop even though the catchment is not necessarily appropriate for it, and this is undermining the progress made in other areas. Closer engagement between water companies and farmers at a catchment level could assist with prioritisation of multi-farm activity (production of public goods) to deliver optimised outcomes at a far more transformational level than is currently possible under existing Common Agricultural Policy-driven approaches.