Climate Change Adaptation Report Consultation

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Online questionnaire responses

Please note: all consultation responses have been published verbatim without edits.

Type of Organisation	Organisation	Do you agree with our assessment of climate risks?	Comments in response to Anglian Water's assessment of climate risks	Do you support our adaptation strategy and the actions we propose to take?	Comments in response to Anglian Water's adaptation strategy and proposed actions	Are there any further opportunities to collaborate and solve problems in partnership?	Comments in response to further opportunities to collaborate and solve problems in partnership	Anglian Water's (brief) response to consultation comments
University	Cardiff University/ Centre for Climate Change and Social Transformations	Y	None	Y	An important element of future plans is demand reduction. We strongly support this strategy. However, it also appears that a substantial section of demand reduction will be driven by smart metering. It is not clear how successful this will be. Studies on energy smart meters has shown that it may lead to 5% reduction but not in all cases. Therefore we would suggest careful consideration and further research into the extent to which smart meters will help achieve demand reduction targets.	Y	Following on from our previous comment. There is an opportunity to research how smart meters may help (or not) reduce water demand. It may also be interesting to examine how different elements of the demand reduction strategies can work in parallel and therefore lead to greater savings (e.g. smart meters + information campaign + in house visits)	We agree. For the past three years we have been trialling a second generation of smart meters, in two areas: Newmarket (Suffolk) and part of Norwich. The Newmarket trial has been combined with a whole-town focus on water efficiency and wider communications about water. These trials have shown a reduction in consumption, and also have helped identify leaks in customer properties, and on our own network. We have made a cautious allowance for smart meter savings as we roll them out, and will review this at WRMP24.
Other	Waterwise	Y	I really like the risk assessment dashboard and in fact the whole report is very good. On p16 I would refer to very low vulnerability rather than no vulnerability as not sure you can say no vulnerability given we could have an extreme event. On p19 we welcome the smart meter roll-out. Not sure I understand the statement about some of the £720m being funded from direct procurement… don't you mean purchased by direct procurement? On p20 we welcome the statement around demand management offsetting the need to take more water from the environment - this is a major plus and perhaps more could be made of this externally. There is very little about reducing non household consumption which is likely to feature in the governments next SPS and PR24 and was covered in a recent letter from Ofwat to company CEOs.	Y	I have focussed my comments on the water supply chapter	Y	Waterwise already works closely with both WRE and Anglian Water on water efficiency. It would be good to do some collaborative work looking at water neutral developments; the link between saving water and reducing environmental pressure and the link between saving water and carbon emissions	The Water Supply chapter has been updated based on the specific comments made and we will discuss the opportunities for collaboration highlighted.
Local Authority	Anon	Y	· The assessment focus on the effects of CC and identifies the most important physical risk factors: water supply, sewer flooding, flooding of AW sites and natural capital. · The transition risks of a failure to meet the climate goals are not communicated effectively as being the driving factor affecting the other risks described. Greater explicitness in the relation between this risk and the others would provide better balance, accuracy and context to the adaptation plan."	Y	· In the water supply measures chapter it is recommended the transfer of water from surplus in north areas of the region to the areas of water deficit in the south. These measures are welcomed and supported, alongside with more local measures like the reduction of abstraction pressures on the chalk streams, retain and restore water in the landscape of the region and potentially more water re-use. · Supportive of Anglian Water's industry leading response to the low carbon transition, however it is unclear how the stated net zero 2030 targets for operational and capital carbon will be realised subsequent to the 2024/25 targets. · Greater clarity around the impact of different adaptations in order to decarbonise operational and capital carbon emissions would be beneficial in understanding how these objectives will be realised.	Y	· Working in partnership with the Councils is important as we develop the Local plan. The local authority is a member of Water Resources East (WRE) which works collaboratively with regional stakeholders on water resource management planning of the region. · Anglian Water could better demonstrate leadership in line with their proactive approach to climate change related risk and adaptation and support broader industry transition though sharing of experiences and best practice.	Agreed. Even if climate goals are met we will still be exposed to physical and transition risks. Furthermore, failure to meet climate goals will exacerbate these risks. Additional content has been added in the introduction to transition risk section to make this point. A brief summary of how net zero will be achieved has been included in the Transition chapter, i.e. energy efficiency, generation and purchase of renewable energy, designing our carbon from new investment and use of insets/offsets. More information is available in the Water UK Routemap which was published in November 2020. Our CEO Peter Simpson has modified his introduction to demonstrate the commitment he and the company are making to support a resilient net zero transition well beyond Anglian Water's boundary.

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Local Authority	Central Bedfordshire Council	Y	We broadly agree with the risk assessment, however we believe that not all risks and mitigation measures have been identified. We believe that impact of rising temperatures on water treatment process and water quality under WFD needs to be included. The identified risks capture the impacts but not all the triggers, more should be done to recognise urbanisation and increased population pressures on these, particularly the physical risks. The risk assessment of climate change impact on water resources shows that majority of WRZs are not vulnerable. This gives impression that there is no need for water demand management in these zones and may be perceived that LPAs located within them have no need to require the optional higher water efficiency standard of 110 litres per person per day. More explanation is needed to make it clear that although some zones are not vulnerable, overall, across the region there is reduction in available water and water demand management actions are needed across the region to balance demand and supply.	Y	We agree in principle with the identified actions, but many of them lack clarity on how AW is intending to achieve them. AW acknowledges that actions will require coordination and cooperation with other stakeholders and partners but does not specify who they are and does not identify steps needed to implement each of the actions. We have set out below detailed comments on each chapter: 1. Demand management · Reducing leakage "AW should have a clear commitment to proactively upgrading their network as opposed to a reactive approach based on these being identified and reported. Much of the infrastructure is ageing and unfit for purpose. · Reducing water consumption "the £720m allocated by AW/Ofwat is intended to manage increase in demand from planned growth/increased population in AWs region, however it is not clear over what period the £720m is to be allocated and how/whether this will keep pace with growth as it is delivered in real time. i.e. what guarantee is there that at the regional level, we will not abstract more water from the environment to accommodate housing growth, if growth is delivered before the measures to reduce water consumption are delivered. More certainty is needed that AW can frontload improvements and match pace of growth in their region. £520m of the allocation is for supply-side measures, which is misleading, as it seems £200m is available for these demand management measures. This is not included on the graphic of supply side measures proposed.] The aim to reduce water consumption to 80l/p/day is not included in this section, despite being cross referenced elsewhere in the plan. This is an aspiration that should aim to influence the delivery of strategic growth in the area. Achieving the 80l/p/day standard will require implementation of sustainable measures such as water recycling systems. These measures come at a cost that needs to be factor into viability assessments. Currently the house building industry is not incentivised to do this, and the planning framework does not enable LPAs to require it. AW is not a statutory consultee and is not actively involved in the design phase of new development, as such they have little scope to influence the process.	Y	As above, engaging with LPAs and the planning process is a necessity if sustainable water consumption and surface water drainage measures are to be incorporated into new development, this is particularly urgent on the design stages of large-scale phased development. AW should commit more resource including officer posts to facilitating partner engagement, as this is currently lacking. This should be a key priority/measure to be delivered within the plan period.	General - The risks included in the report are the 'headline' risks. These headline risks represent a selection, and in some cases an aggregation, of some of the 40+ risks we identified. The impact of rising temperatures has been captured within these 40+ risks. Thank you for the point about the need to identify more of the triggers. We accept the report could have gone further in this regard. We will build this learning into future assessments and plans. Demand management and supply-side measures. We agree with your point about the impression we may have given that demand management is not required in all zones. The final report has been modified to address this point. Our Business Plan does balance the need for proactive renewal of our mains network alongside reactive repairs. Phasing of the investment and licence constraints will ensure we balance the timing of what we abstract and supply. We have revised how we describe the planned investment in the report to improve clarity. We have reviewed and improved our references to the ambition to reduce per capita consumption. We will continue to engage through Water Resources East on the project described. Sewer flooding - While £28m is lower than we would like, it is based on cost: benefit analysis and delivering those that are cost beneficial. Upsizing sewers is one option, but as the remaining projects become less cost beneficial we have modified our strategy to deal with surface water at source, e.g. through our Make Rain Happy campaign. We have carried out and will continue to carry out joint modelling with other risk management authorities. We agree with the need to increase public awareness and are in the process of developing a web-based system to share data with partners and the public (in line with one of the National Infrastructure Commission's recent recommendations). Water UK is leading a piece of work to address the automatic right to connect, which involves Anglian Water and others in the water industry. We proactively engage with the planning process both at local plan development and, wherever possible, at planning application stage. We recognise the differences between Internal Drainage Boards and ourselves and will continue to look at how we can improve our engagement generally with the resources available. The planning teams, and others, will continue to be available to deal with particular issues.

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					It is not clear from the plan how the ambitious objective to achieve the lower rate of 80l/p/day will be achieved. AW should be clearer on steps is planning to take to make it happen. LPAs do not currently have the ability to insist on lower consumption rates than the 110l/p/d. This is the most stringent standard allowed under the current Building Regulations and can only be applied if LPA can demonstrate the need for it and embeds it in a local planning policy. AW should lobby government to introduce more stringent water efficiency standard through the Building Regulations and provide LPAs with evidence base in support of this higher standard to enable them to embed it in a local planning policy. This is recommended as an action AW should commit to. 2. Supply side measures · CBC has been working with Water Resources East on the potential to deliver the Bedford/Milton Keynes Waterway and unlock benefits for water resource transfer, moving water from areas of surplus to those in deficit. We would be keen to see this included as an objective and future project, with AW investment to realise multiple benefits for AW, its customers and the wider environment. 3. Sewer flooding · £28m (over 5 years) is too low to achieve high impact solutions, and considerable disproportionate to the £720m allocated for demand/supply measures. It is not clear how this weighting has been attributed. Given flood risk forms 2 of the 4 physical risks identified in the report. It is not clear how accurate the reporting of sewer flooding is to AW by customers, or whether AW have properly assessed how this is reported and whether the figures they have are representative of flood events occurring. The reason being that CBC is aware of multiple events where flooding from the sewer has been reported to the local authority and not to AW, for example in 2016 50+ properties were flooded in one rainfall event in Dunstable, this was a result of combined flooding from surface water and the sewer network; AW held no reports of flooding from the event, despite further investigating showing the majority of their system was exceeded in the 1 in 10 year event. There is a clearly under reporting of events and misunderstanding of residents/AW customers on who is responsible for flooding. AW should commit to a truthing exercise to determine any misrepresentation of flood reports. · We strongly support the action to upsize the sewer system. There should be a commitment to do this proactively in areas of known capacity stress and planned future growth. AW should work with LPAs to identify these areas.			A process for partnership funding is in development which ensures collaboration and clear allocation of responsibilities to ensure we all do the right things for our customers and communities. We are working with partners to install rain gauges on sites across our region and all data will be shared with partners. Natural Capital - 10% is what is expected to be mandated through the Environment Bill, so our starting position has been to align ourselves with that. For applications subject to planning permission we will need to meet whatever target the local planning authority has in its planning policy. Interdependencies - The policy development section has been revised.

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					· The risk of sewer flooding can not be considered in isolation of surface water flooding, an integrated approach to modelling is needed to identify areas of increased vulnerability and these areas identified for planned delivery of improvement measures. AW should work with Local Authorities and other Risk Management Authorities for this purpose. · The risk of flooding from sewers is under rated by the public, the EAs surface water maps do not accurately account for sub-surface drainage or the risk of exceedance and combination with surface water flows. AW should commit to increasing public awareness of sewer flooding and spatial data/mapping to improve public/ partner knowledge of this. This should be a commitment by AW. This would help improve the uptake of local measures by property and business owners and improve property resilience to the risk of flooding. · We support the removal of the automatic right to connect, however note that this has been an ambition since the Pitt Report was published in 2010. An investigation into the blockers/resistance to the removal of this should be undertaken by AW to identify what measures may be needed to overcome these. It is also not clear how this would be conditional given AW/WaSCs are not statutory consultees and not currently involved in a uniform way across their region by LPAs in the planning process. More is needed to establish them as a key stakeholder and consultee. IDBs are not statutory consultees but by comparison are more engaged in the LPA process than WaSC, demonstrating that this is possible and that they can have a tangible input on the planning process resulting in more effective/informed schemes. This is particularly pressing given the change in SUDS adoption by WaterUK, the adoption process can not be left until the end of the planning process and needs to be entwined with the design/master planning stage to ensure SUDS will be integrated into new developments in a way that promotes surface level, passive features which provide wider benefits for the users of the site and the environment. · AW needs to provide a framework/clarity on what constitutes a partner led scheme that is partially funded by AW, and where AW should be required as infrastructure operators to lead on reducing the risk from their network, where this is known to be a leading factor in flooding occurring. Otherwise, we consider that AWs responsibility to reduce flooding from their network is being passed/subsidised by local authorities, when they should be responsible for planning and funding the necessary remedial/upgrade works.			

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					· AW should commit to the installation, operation and maintenance of weather systems on their sites to monitor rainfall (and other data) in real time and use this to track the impact and reduction of climate change risks, as measures are delivered. This data should be made available to local authorities and risk management authorities for mutual gains. 4. Natural Capital · The document refers to AW voluntarily providing a 10% net gain in biodiversity on all future projects. This will only meet the requirements set out in the Environment Bill and will only deliver the statutory minimum and therefore will not provide any added benefit. AW should stretch this by committing to a net gain of 20% where possible. 5. Interdependencies We support the actions identified under policy development. Of importance are: · Part G of Building Regulations should require all new homes to be fitted with appliances, fixtures and fittings that meet a minimum water efficiency standard, based on the labelling scheme above. Minimum standards should tighten over time, so that new homes from 2022 use 100 litres per person per day (l/p/d) or less, falling to 85 l/p/d or less by 2030. AW should take a stronger stance in how this can be delivered and what role they may have in bringing this forward, as legislatively LPAs can not insist on the lower rate of 85l/p/d and industry is not, in our experience, minded to accord with this. AW need to be more engaged with the planning process at the design/concept stage, despite not being a statutory consultee. AW should commit to providing advice to LPAs in respect of water consumption, in a pro-active and uniform way across their region. We strongly recommend AW take this forward as an action. This is also necessary to ensure effective implementation of the DCG, ensuring SUDS designs that are approved by the LPA are aligned to the DCG criteria (avoiding orphaned/unadoptable SUDS, should AW only be consulted on design once it has been approved by the LPA i.e. at the point of adoption).			

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					· Significant new developments in areas of severe water stress should also be water neutral, whereby the additional consumption of treated water is offset by water efficiency schemes in nearby housing developments, schools, hospitals and care homes. This policy should be applied via local plans, or for schemes such as the Oxford-Cambridge Arc, via a National Policy Statement or Statutory Spatial Plan. This measure would help promote community-scale rainwater harvesting, and green and grey water recycling, to reduce a development's consumption of water abstracted from the environment. It is not clear how this would be achieved given that local plans can not set a policy that requires water neutrality. The AW needs to better understand local plan process and legislative framework around requiring higher than national standards. · Local plans or other statutory planning documents should also require all new development to be nutrient neutral, so that the environment isn't harmed by heavier nutrient loads from effluent and increased runoff. This means additional nutrient loading would need to be minimised, and any residual increase offset by catchment management approaches in partnership with local landowners - It is not clear how this would be achieved, this would no doubt be seen by the industry as an additional burden on housebuilders. There would need to be a baseline understanding of the existing loadings to determine where this is most needed, and the design requirements for new development to control nutrient levels on site. Prescriptive guidance for the development/construction industry is recommended as an action AW should commit to. It is not clear how AW commits to supporting the above proposed measures or introducing new regulatory measures to achieve this standard in the future.			

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Local Authority	Harborough District Council	Y	The management of surface water to include biodiversity and water quality is especially important.	Y	Additional support to deliver water saving in new developments would be welcome	Y	Working with planning authorities and developers to promote best practice SuDs schemes, perhaps with some benefits to developers who build such schemes, until regulations are in place.	We recognise that there have been historic surface water flooding issues in Market Harborough. One of our responses has been to promote SuDS on new developments through the Design and Construction Guidance (DCG), which is part of the new Sewerage Sector Guidance (SSG). This replaces Sewers for Adoption, and includes certain SuDS that can be adopted through s104 as sewers. We've been at the forefront of this work (having offered SuDS adoption on new build sites since 2012) and have recently delivered a number of region-wide webinars to external stakeholders about how we're delivering the DCG.
University	Imperial College London	N	The report demonstrates a wide consideration of climate risks in the water sector, and we acknowledge the mention of systems thinking. We also support the use of UKCP18 projections in assessing the future climate risks, and the companies ambition to achieve the net zero carbon by 2030. We would like to comment on two aspects of the climate risk assessment that would need further consideration: 1. While we acknowledge the effort to account for interdependences in addressing cross-cutting risk, we believe that these could be further expanded to include: · Interdependences within water infrastructure system, including operational decisions. Our proof-of-concept modelling [1] has shown that by integrating modelling of water supply and wastewater systems we can more accurately predict impacts on the natural environment and address the important aspect of cross-cutting risk to water quality. · Interdependences within natural capital systems, including the link between green infrastructure, housing and people. This is particularly important from the perspective of flood risk management and multiple environmental benefits [2], as well as the complexity of the natural capital/green infrastructure planning process that involves multiple stakeholders across a range of urban sectors [3]. 2. We also acknowledge the challenge to address the uncertainty linked with future climate; however, across cross chapters the concern we have is the lack of attention that has been paid to communicating that uncertainty. Statements like "climate change is reducing supply by 58Ml/d" implies confidence on projections that is simply not possible given the high level of uncertainty inherent in current climate predictions, and particularly those relating to drought. We acknowledge the challenges in communicating uncertainty, but we believe that a climate change report should make an attempt at this.	Y	We broadly agree with the proposed adaptation strategies, however, we would like to comment on some specific aspects that could be revised, which we summarise below: 1. Chapter 1: We broadly agree with the water supply strategy and think that this is a well thought out section. Detailed comments, particularly around the numbers, can be found at the end of our responses. 2. Chapter 2: This chapter could be more framed in the context of climate change. For example, based on the reductions in sewer flooding it seems unclear to a reader whether climate change adaptation is needed in wastewater at all. Adaptive planning approaches mentioned above [5] could provide a platform for this. 3. Chapter 3: We acknowledge the challenges in protecting critical infrastructure from flooding, and we believe that the role of green infrastructure/SuDS to protect critical assets could be explored. We have showed that in urban environments, SuDS could have a significant role in this [6]. 4. Chapter 4: We fully support the application of the natural capital concept. However, the report could be made more complete by showing how natural capital interventions or capital projects can impact the other 5 capitals. Focusing on SSSIs for the report is important, but it would also be useful to provide an overview of how climate change is likely to affect the natural capital in non-SSSI locations and particularly how this is likely to affect water supply as well as other mentioned capitals. Finally, the perceived benefits for the new pipeline are well documented in the report, particularly in terms of safeguarding particular assets of interest. However, it would be good to also mention the impacts of its construction, particularly on non SSSI natural capital.	Y	The responses above are all linked with the work we are currently doing in the CAMELLIA project [10], and we would be very open to start a collaboration with Anglian Water to explore some of the aspects mentioned above. In particular, we see the opportunities for collaboration in four specific areas of work: 1. Integrated water infrastructure planning. We are creating software that enables high-level modelling of joint supply-consumption-wastewater-river system " with a focus on in-river water quality metrics. We are currently exploring creating an integrated water infrastructure model of the Lower Thames in collaboration with Thames Water, but are open to looking at a variety of regions. 2. Link between water management and urban planning, which develops approaches that integrates built and natural infrastructure through systems thinking and informs data collection and modelling to assess trade-offs and co-benefits of proposed water management interventions [11]. CAMELLIA is working with a range of project partners to develop methods and solutions to aid this process. 3. Linked to the above, the 6 Capitals approach comes across as a clear and useful way of describing the impacts of actions undertaken by Anglian water. This could be further advanced by examining the impacts not only of an intervention on one of these capitals, but also the interactions between the variables themselves. A systems approach allows for such exploration. We believe this would provide some excellent opportunities for collaboration. 4. Participatory approaches to decision-making and infrastructure design with community and stakeholders. CAMELLIA has developed co-design tools and methodologies, offering new routes to support local communities to produce systemic change. Work done on the Kipling Estate in London [12] is an example of the potential for positive water impacts on a small-scale green infrastructure design with community-led design.	Anglian Water would like to meet with Imperial College London to explore their detailed comments and opportunities (e.g. CAMELLIA). Summarised below are some of the actions we will take in response to their extensive and valued comments. We support the comments made about the need to better understand the interdependencies within natural capital systems. We are working closely with Water Resources East as part of our strategy to tackle the climate-related risks such as drought and flooding in an integrated way. We have included a case study on 'Future Fenland' to highlight this. We also accept that in drafting the report we could have made the inherent uncertainty much clearer. We have modified the Executive Summary to emphasise the challenge of managing uncertainty and the steps we are taking to improve our approach as we approach our next periodic review period. Modifications have been made to Chapter 2 to clarify that while sewer flooding events have reduced, the underlying risk of sewer flooding will increase as rainfall intensity continues to increase. The decreasing trend in sewer flooding events has been down to operational measures (thereby reducing blockages). The 'Understanding risk' section of Natural Capital has been modified to highlight the opportunity offered to the other capitals by effective management of natural capital . The six capitals approach will be used to help consider the wider impact of our programme, including the strategic pipeline programme - while in operation and during construction. The aspiration to achieve zero pollutions links closely to the risk and interventions identified to mitigate the risk of sewer flooding. The references in the report to absolute leakage rate have been extended in response to your helpful feedback.

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			Approaches such as adaptive pathways that we have implemented to analyse future planning of drainage systems [4] could provide a platform for this. References: [1] Barnaby Dobson and Ana Mijic, Protecting Rivers by Integrating Supply-Wastewater Infrastructure Planning and Coordinating Operational Decisions, EarthArXiv, 2020. [2] Juan Ossa-Moreno, Karl M Smith, and Ana Mijic, Economic Analysis of Wider Benefits to Facilitate SuDS Uptake in London, UK, Sustainable Cities and Society, 28 (2017), 411"19. [3] Mohamad H El Hattab and others, Applying the Systems Approach to Decompose the SuDS Decision-Making Process for Appropriate Hydrologic Model Selection, Water, 12.3 (2020), 632. [4] Filip Babovic and Ana Mijic, ˜The Development of Adaptation Pathways for the Long term Planning of Urban Drainage Systems, Journal of Flood Risk Management, 2019, e12538.		5. Chapter 5: Following the comments above around the potential role of water quality in water infrastructure planning [7], we would suggest that the environmental scope could be extended beyond net zero carbon concept to include aspects of moving towards zero pollution in water sector. This ambitious target would link closely to the high-level Imperial College initiative on Transition to Zero Pollution [8]. 6. Chapter 6: We acknowledge that linkages to (e.g.) the energy sector are surely important, but there are plenty of interdependencies within different sectors of water that fall entirely within Anglian Water's scope, which could be explored in more detail [9]: · Water supply is linked to wastewater; abstracting from the rivers that are used for wastewater discharge. · Wastewater recycling is an option mentioned that depends on both supply and wastewater systems. · The role of significant reservoirs on rivers that also have flood control reservoirs. · Link of all of these sectors that are interacting in terms of natural capital. 7. Chapter 7: We acknowledge that the need to adapt to climate change and the outcomes are well described, and that 70% of respondents to a survey were happy to future proof the system. However, it would be interesting to know what the other 30% felt was more important. It was also good to see that the risk to customer satisfaction is linked to the performance of all other capitals highlighted. It would be great to see this in other areas too. 8. Case studies: We acknowledge the very good description of the Norwich to Ludham pipeline and the benefits of doing so. The Canvey Island case study is an excellent example of collaboration between stakeholder groups. This is particularly clear in the line: Operational teams sharing resources, including working on each others assets to restore serviceability to customers. Managing surface water in Grimsby comes across as a great example of incorporating SuDS and green infrastructure to manage surface water. Some quantification of the benefits and disbenefits of these changes would help promote and justify these benefits in other regions. These benefits come across clearer in the Basildon and Thurrock University Hospital example.		The comments were put together by the following CAMELLIA team members: 1. Jimmy O'Keeffe, Research Associate, Imperial College London, jimmy.okeeffe@imperial.ac.uk 2. Barnaby Dobson, Research Associate, Imperial College London, b.dobson@imperial.ac.uk 3. Greta Antonini, CAMELLIA Programme Manager, Imperial College London g.antonini@imperial.ac.uk 4. Ana Mijic, Senior Lecturer in Water Management, Imperial College London, ana.mijic@imperial.ac.uk References: [10] https://www.camelliawater.org [11] https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Integrating-green-and-blue-spaces-into-our-cities---Making-it-happen-.pdf [12] https://www.ucl.ac.uk/engineering-exchange/research-projects/2019/may/co-designing-community-garden	As we embed the TCFD approach into our business we are improving how we express the climate-related risk and investment in financial terms. This will allow us to provide the financial comparisons suggested (e.g. leakage) more easily. The change in the reporting requirements has artificially increased the reported number of internal and external flooding incidents, as per the note under the table. The "~0%" target for risk of sewer flooding in a storm is better expressed as "tending towards zero" i.e. it may be unrealistic to achieve zero, but we need to get as close to that as possible.

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					Detailed comments: Chapter 1, water supply: · P17, Paragraph 2: Why not use the per head or per megalitre supplied value - comparing on the basis of absolute leakage seems meaningless (e.g. we achieved a leakage rate of 186Ml/d. This is 15% of total water abstracted and is half the industry average of 30%.) · P19: I like the Figure but I wonder if a second plot in absolute megalitre terms would be more useful · P23: · A lay reader might be confused at what you will do differently to meet the 2024/25 leakage target - Between 09->14 you reduced leakage by 19Ml/d, then 14->18 by 5Ml/d... then over the next 5 years you aim to reduce by a further 30Ml/d. How does this £70million for leakage reduction compare to what has been spent on it over the last 8 years? · Also a bit confusing is that water supply interruptions are being reduced going forward but security of supply index remains at 100 for all periods - it doesn't seem a very useful index if the security of supply is objectively increasing (by reducing interruptions) but the index isn't changing. Chapter 2, sewer flooding: · P25: Wetter winters is quite different from stormier winters - is there data to show that the rates of rainfall storms has been increasing? · P29: It seems confusing that internal sewer flooding and external sewer flooding are both increasing between 2018->2024 yet the risk of sewer flooding is going down. Also how can you have 0% risk in the long term but still have internal and external sewer flooding. References: [5] Filip Babovic, Ana Mijic, and Kaveh Madani, Decision Making under Deep Uncertainty for Adapting Urban Drainage Systems to Change, Urban Water Journal, 15.6 (2018), 552"60. [6] Ossa-Moreno, Smith, and Mijic. [7] Dobson and Mijic. [8] https://www.imperial.ac.uk/stories/zeropollution/ [9] Dobson and Mijic.			

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Local Authority	Lincolnshire County Council	Y	The assessment appears to be thorough and well thought through.	Y	There is a good balance between investment in the network and engagement with customers to manager water supply, treatment and demand.	Y	Making the most of opportunities with universities, and new technology as innovation is tested and brought to market.	Comments noted and appreciated.
Local Authority	Luton Borough Council	Y		Y	I support the adaptation strategy	Y	There are further opportunities. Perhaps cross-boundary approaches with other WASCs where an area shares two WASCs	We recognise the issue raised and the need to manage cross-boundary investment needs will be dealt with through the DWMP process.
Local Authority	Milton Keynes Council (LLFA)	Y	We are pleased to see how the report has identified and assessed the climate risks faced by Anglian Water Services Ltd. We welcome the new adaptation strategy and the actions proposed. Furthermore, we wish to acknowledge the long term ambitions featured. We have provided comments under each of the climate risk headings for your next question. Our comments refer to section of the Local Plan for Milton Keynes, Plan:MK, which was adopted by Milton Keynes Council at its meeting on the 20 March 2019.	Y	Physical Risks Risk to public water supply (drought) " In line with Plan:MK simple and more innovative measures such as water butts, rainwater harvesting and greywater recycling systems should also be pursued where appropriate, alongside the use of water efficient internal fixtures (taps, baths, showers, etc.) to further reduce the demand upon mains water and the amount of water which requires treatment. The LLFA welcomes any opportunity to explore this further with Anglian Water (such as the Make Rain Happy campaign). Milton Keynes has experienced several burst mains events in recent history and would seek further information on how future events would be mitigated. Risk of sewer flooding - Several areas within the Borough of Milton Keynes experienced significant rainfall during May 2018. Flooding occurred due to the intense rainfall event, which led to the exceedance of local drainage systems, over 500 properties were internally flooded and approximately 1000 properties were affected by flood water. In some locations the drainage systems are reported to have needed maintenance. Even if the systems were in optimum condition, they would still have been unable to manage such a significant rainfall event. In line with Plan:MK FR2, we reiterate the importance of SuDS being designed with an allowance for climate change and the potential impact it may have over the lifetime of the proposed development. We note the report identifies that there has been a reduction in sewer flooding over the last five years. Flooding is complex; we believe more awareness is needed to ensure sewer flooding is correctly reported. In Milton Keynes, some instances may go unreported to Anglian Water. Improved reporting systems between the Local Authority and Anglian Water and an awareness raising campaign to inform residents of all sources of flood risk could support more accurate reporting. Excellent partnership working has already taken place in Milton Keynes aimed at targeting and reducing both surface water and sewer flooding. Local sharing of data has supported a reduction in sewer flooding and all sources of flood risk as well as adapting a collaborative and proactive risk based approach.	Y	The LLFA welcomes any opportunity to explore this further with Anglian Water (such as the Make Rain Happy campaign). Milton Keynes has experienced several burst mains events in recent history and would seek further information on how future events would be mitigated. The LLFA values the Lead Local Flood Authority officer forum, which has been established. Furthermore, we wish to acknowledge the many merits of the Partnership Funding programme. Improved reporting systems between the Local Authority and Anglian Water and an awareness raising campaign to inform residents of all sources of flood risk could support more accurate reporting. Excellent partnership working has already taken place in Milton Keynes aimed at targeting and reducing both surface water and sewer flooding. Local sharing of data has supported a reduction in sewer flooding and all sources of flood risk as well as adapting a collaborative and proactive risk based approach. Local Authorities have substantial land holdings and are also involved in promoting biodiversity. What opportunities have been investigated to work more closely and reach a common goal? The LLFA seeks further co-ordination with Anglian Water's Surface Water Drainage Policy to ensure that any proposed discharge rates are appropriate not only in relation to the drainage network but also for flood risk prior to approval of any planning permission."	We are grateful for this response from the Flood and Water Management Team/LLFA which also included expertise from other internal teams. We recognise that, while comprehensive, it was not possible to fully address all areas due to commitment to the Covid-19 response. Responses to some of the key points are included below, and can be discussed in more detail at our established forums. We agree that there is value in considering water-saving initiatives and surface water management in conjunction with each other. This is something we have started to explore. We agree that drainage solutions must consider climate change and will adopt SuDS up to and including the 1:100+climate change. We too recognise that flooding is complex and that we need to continue to work with other risk management authorities and communities to simplify the process and improve reporting. Your comment that it is not just SSSIs that need to be protected from climate change aligns with feedback from other respondents - and our own view. We have modified our report to clarify this point. Biodiversity Net Gain - 10% is what is expected to be mandated through the Environment Bill so we have aligned ourselves with that. For applications subject to planning permission we will need to meet whatever target the LPA has in its planning policy. Wetlands - We are planning to deliver the wetlands, subject to feasibility, by 2027. The location of these wetlands will be strongly influenced by the location of the accompanying water recycling centre and the permits we need to meet, so we don't have a lot of flexibility in terms of where they are sited. In all locations chosen we expect them to make a significant contribution to biodiversity in that catchment. Influencing landowners and farmers - at the moment our primary focus is on water quality, so our engagement with farmers is focused on issues such as pesticide pollution. As the evidence base grows and the regulatory context changes, there should be more opportunity to work with farmers on these topics. We are currently working with NCC and other partners looking at how we could pay farmers to help reduce flooding of our sewer network.

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					Risk to services from flooding " The LLFA values the Lead Local Flood Authority (LLFA) officer forum, which has been established. Furthermore, we wish to acknowledge the many merits of the Partnership Funding programme. Risk to natural capital - It is important to recognise that there are many other sites, which can be equally important as SSSIs, but which do not have the same level of protection. Many of these sites have been identified in the Borough and are classified as Milton Keynes Wildlife Sites (MKWS). There are 16 MKWS and approximately 200 local wildlife sites in the Borough. MKWS are equivalent of Local Wildlife Sites (LWS) in other Buckinghamshire districts while our smaller local wildlife sites have a status of Biological Notification Sites (BNS). For the Milton Keynes, the linear parks, woodlands, grid road corridors and balancing lakes provide more than attractive amenity spaces; they provide connectivity for people, wildlife and water. SuDS should be seen a positive tool for providing local amenity benefit as well as managing flood risk. As such, we would seek that appropriately designed landscaping is in place and maintained for the lifetime of any SuDS related features as well as existing drainage networks e.g. so that roots do not impact on pipework or stability of any banks. Further comments below: · Voluntarily apply biodiversity netgain to our projects from April 2020, helping the region's wildlife to become more resilient to climate change. The percentage of gain (10%) is quite low, given that not all gains are achieved a minimum of 20% should be set. Can Anglian Water Services Limited confirm wherever possible the gains will be on site? · Investigate the opportunity to build 34 new low carbon wetland sites. Highly commend this approach as follows the think local act global philosophy - the more the better especially if well integrated in the community offering an education and recreation resource. What is the time span to complete the investigation? Look to adopt Lawson principles to the creation of new wetlands " bigger" better and more connected. A great potential to reduce flooding and habitat creation " how is Anglian Water influencing landowners and farmers to take this on (as opposed to the pollution work they are already under taking)? Have mapping exercises been undertaken to identify suitable areas for seasonal flooding " these could feed in to Local Nature partnerships and Local authorities and help steer potential biodiversity off set payments?			We would consider working in partnership to undertake mapping exercises to identify suitable areas for seasonal flooding to occur, as we are currently doing in North Norfolk. However, we believe that such an exercise would be better led by the Environment Agency for main rivers, and the lead local flood authority for ordinary watercourses. We are not aware that such mapping has been undertaken across the region yet, but we have been investigating specific locations where we have problems that could be solved by a catchment-based solution. For this to become more mainstream we need to be able to better quantify the risk reduction provided by such approaches. Non-native plants and animals - we have a good understanding of which invasive species are a current or potential future problem for us. We have engaged with staff to ensure they understand our duties and can carry out their operations in a biosecure way and we eradicate or manage invasive species as necessary. We also fund a water industry partnership with government to tackle invasive species at a strategic level. We would welcome approaches from any land owner, including local authorities, who thinks there are opportunities to collaborate to enhance biodiversity across multiple landholdings Hydropower has been investigated. In fact our first project was at our Water Recycling Centre at Milton Keynes. We have been unable to develop a hydro programme of sufficient size to make it attractive due to the topography and relatively low flows in our systems. Recognising the importance of renewable power, we will continue to review this on our journey to net zero. We welcome the comments that highlight the limitations of the current planning system for tackling water demand in new development. We agree that it will be necessary to build a robust evidence case for concepts such as water neutrality to demonstrate that they have an important role to play to overcome potential water availability constraints to growth. Of particular importance will be ensuring such measures are captured as part of the government's planning reform proposals. We also recognise the importance of clear implementation and monitoring mechanisms and we look forward to continuing to work with Milton Keynes Council as a key partner to develop, test and scale best practice so that measures are delivered without causing unnecessary risk or delay to development.

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					What actions are being taken on non-native plants and animals? Local Authorities have substantial land holdings and are also involved in promoting biodiversity. What opportunities have been investigated to work more closely and reach a common goal? Transitions Risks The report describes that decarbonising the energy sector can increase energy prices and volatility. One of the long term ambitions of Anglian Water is to be net zero carbon business by 2030. As part of this, there has been grid electricity consumption via use of biogas in addition to the identification of solar energy installations, which will cut down on cost. Milton Keynes is committed to protecting and promoting biodiversity by maintaining and extending our green/ blue infrastructure. This includes caring for and adding to the millions of trees growing here, which contributes to capturing the city's carbon emissions. We note that in August 2019, Anglian Water announced a joint initiative, along with other English water companies, to plant 11 million trees by 2030. In relation to the generation of electricity production using solar farms, it is unclear why there is no reference to hydro-power. Would Anglian Water investigate opportunities to generate hydro-power? Milton Keynes is a prime example where is could be assessed. Please note, it is unclear if these costs relate to water supply, or pumping surface water or foul water sewers. The Upper Ouse Authorities follow a philosophy of engaging all new developments to achieve gravity connections to reduce the cost of pumping and reduce flood risk in the event of infrastructure failure. We believe there are missed opportunities during the planning process to reduce these costs even further. Cross-cutting Risks · Significant new developments in areas of severe water stress should be water neutral whereby the additional consumption of treated water is offset by water efficiency schemes in nearby housing developments, schools, hospitals and care homes (to be applied via local plans); would allow green/ grey water recycling. Further explanation of what is considered a significant new development. This could potentially include any development which will require an upgrade to infrastructure to support economic growth and/or community welfare. The Plan:MK already recognises severe stress areas. A majority of the Borough falls into the Ruthamford South Water Resource Zone, which is one of the zones within the Anglian region that is the most water stressed. The level of water stress in Milton Keynes and the wider area demonstrates the need to adopt the optional higher water efficiency standard within Building Regulations Part G for new dwellings.			

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					Greywater recycling and other measures are proposed. Para 20 of the NPPF requires that strategic policies within the plan make sufficient provision for water supply amongst others. Optional standard currently does not allow us to restrict consumption beyond the 110l/p/d. · Minimum standards should tighten over time, so that new homes from 2022 use 100 litres per person per day (l/p/d) or less, falling to 85 l/p/d or less by 2030. Policy SC1 currently requires all newly constructed dwellings will be required to achieve an estimated water consumption of no more than 110 litres/person/day, which is with the current higher water efficiency standard required by Building Regulations Part G which is being secured via a condition. Proposed new limits will be looked at as a part of the review of the Plan:MK. If the proposed new min standards were imposed would this help in achieving water neutrality? · Local plans or other statutory planning documents should also require all new developments to be nutrient neutral, so that the environment isn't harmed by heavier nutrient loads from effluent and increased runoff (In line with the proposed Environment Bill). This means additional nutrient loading would need to be minimised, and any residual increase offset by catchment management approaches in partnership with local landowners. Natural England has been advising that larger developments (in excess of 200-300 houses), including all EIA development, should calculate a nutrient budget and achieve nutrient neutrality. Plan:MK currently does not have any specific policy in relation to achieving nutrient neutrality. There are existing requirements of the Conservation of Habitats and Species Regulations 2017 (as amended) in regards to nutrient neutrality. Natural England has prepared a methodology setting out how this can be achieved, which is available on request from Natural England. We would like to note that the nutrient neutrality may be difficult to achieve for smaller developments or on brownfield land. More thought should be given in regards to potential issues with compliance and enforcement- which body will be responsible for compliance?. How would the offsetting work e.g. will a financial sum to support catchment-wide projects be provided? Would this need to be secured via S106, or achieved via another permitting regime administered by Natural England/EA? - Planning authorities should have a duty to act consistently with local Nature Recovery Strategies proposed under the Environment Bill, to make sure development decisions do not undermine these new environmental spatial plans. Noted, no objections.			

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					· The automatic right to connect new development to surface water and combined sewers should be made conditional. Plan:MK recognises the need to Greywater recycling and the need for other measures to further reduce the demand upon mains water and the amount of water which requires treatment. Clear guidance will be required in regards to what evidence will need to be provided and what measures to allow a new development to connect to surface water and combined sewers. In order to ensure the planning process is not unnecessarily delayed (e.g. clear consultee responses/compliance checks) it should be made clear if this is to be enforced through the planning system. FR1 - FR3, Plan:MK includes locally specific strategic flood risk management policies to maintain and continue the exemplar sustainable drainage model of Milton Keynes, which prohibits development within the floodplain and seeks flood management and drainage infrastructure to be provided as strategically as possible and as part of a maintained, multi-functional blue-green infrastructure. As part of this, the LLFA seeks further co-ordination with Anglian Water's Surface Water Drainage Policy to ensure that any proposed discharge rates are appropriate not only in relation to the drainage network but also for flood risk prior to approval of any planning permission. Proposed developments should be assessed on a case by case basis where a lower discharge rate is anticipated that makes use of improved SuDS designs. This is particularly important in those areas of Milton Keynes that are classified as critical drainage catchments. The position of the LLFA in this matter is reinforced by Plan:MK, which states: Policy FR2, B, 7 - All surface water drainage proposals for new development must include full details of the means of achieving future management, maintenance and adoption of the systems, prior to approval of any planning permission, to ensure that it will function effectively over the lifespan of the development. This will include details of funding and should be formulated through discussion with the relevant responsible bodies, including Milton Keynes Council, The Parks Trust, Anglian Water and the Internal Drainage Board."			
Local Authority	NELC	Y	Pragmatic assessment do not agree with all but on the whole agree with it.	Y	No comment	Y	Flooding is the biggest issue	Comments noted and appreciated. Grimsby will be one of our key catchments for surface water management in AMP7 and beyond, with plans to undertake SuDS retrofit in a number of locations currently being developed.

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Local Authority	North Kesteven District Council	Y	More could be done to enhance bio-diversity and wildlife at the margins of water courses and reservoirs such as the creation of wetland habitats which would also help retain water and slow down run off into rivers and streams.	Y	Investigation should be undertaken into using existing water courses such as canals for transmission of water to where it is needed.	Y	Yes, dialogue with local canal trusts as well as local water boards and county/district councils should be seen as a very important part in managing, improving and maintaining water resources. The Environment Agency should be a key player in this, but I believe that it is currently not fit for purpose in this respect.	We agree that working across the catchment as a whole, not just at the margins of water courses, can help mitigate the impacts of climate change whilst providing benefits in other ways such as biodiversity enhancement. However, the evidence base for this, particularly in our region, is not strong and needs to be developed in order for us to confidently invest in this sort of adaptation activity at scale. In the meantime we are working with farmers in priority catchments, for example on soil health, which will contribute to adaptation. We are considering the use of canals and other open water transfers as part of the development of new water resources options. Such transfers have potential benefits to biodiversity and for recreation, but require careful management of ecological risks associated with invasive non-native species.
Local Authority	Anon	Y	85% of the world's chalk rivers are in England, many in East Anglia. There is a lack of discussion of the impacts of Anglian Water abstraction activities upon them and how they are to be mitigated in the face of climate change.	Y	I think actions should also include supporting Natural Flood Management (NFM) projects that help in the adaptation to the increased frequency and severity of storm events that are a corollary of climate change.	Y	There are further opportunities to work in partnership, through the Catchment Based Approach, to fund, design, and implement Natural Flood Management Projects.	In our 2019 Water Resources Management Plan we described our extensive plans for reducing abstraction in environmentally sensitive areas, including chalk groundwater and streams, as well as our actions to rehabilitate rivers and provide flow support. We are now working with Water Resources East on a regional plan which will include a new long-term ambition for the environment, including chalk streams. Anglian Water is working with this local authority and others on the LENs project. We are considering whether Natural Flood Management (NFM) on agricultural land would help to prevent flooding in villages across this particular region (we're also looking at the water resources perspective too). The LENS project is an investigation at this stage, hopefully leading to a pilot project in 2021. The concept is that farmers would be rewarded for managing their land differently to provide benefits such as reduced sewer flooding. We're very involved in the catchment-based approach and support any such initiative that is looking to deliver NFM. We need confidence that interventions work, so we support projects that add to the evidence base. NFM may not be as effective in our flat, low-lying region as it is in more hilly landscapes.
Local Authority	Anon	Y	85% of the world's chalk streams are found in England, many in East Anglia. There is little discussion of the impacts of your abstraction activities on these unique and valuable habitats and how they could be mitigated in the face of climate change.	Y	Reference should be made to Natural Flood Management (NFM) and how Anglian Water will support NFM projects.	Y	Yes, work with key stakeholders, e.g. councils, EA, Defra, Rivers Trusts to support NFM and river restoration projects.	

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Local Authority	Southend Borough Council	Y	It looks like a very strong starting point, there needs to be further options to work very closely with local authorities and integrate with strategies that they have in place on this agenda as well, identifying urban greening opportunities could also have a big role to play in the overall strategy.	Y	All seem very sensible, engaging citizens and communities with a very clear, well articulated message will be key.	Y	Yes, working in collaboration with local authorities, such as Southend, and linking in to existing projects and programmes around the urban realm and community engagement would be very important.	Comments noted and appreciated and will be explored through existing strong links.
Government / Regulator	Anon	Y	The overall approach to risk assessment seems sensible, and the consistent approach to measuring risk in accordance with existing risk management strategies is a good one.	Y	We broadly support the strategy and actions as they seem sensible, although there is the question of how increase pumping to move water around the catchment fits with the net zero targets.	Y	The DWMP process promotes working together with other risk management authorities and should be used as the platform to identify and promote partnership working.	Growth and climate change is worsening the supply/demand balance and requiring us to pump water from areas of surplus to areas of deficit. Demand management and energy efficiency provide a couple of the ways that this can be addressed more efficiently, but ultimately we will be reliant on decarbonisation of the grid, generation of renewable energy and insets/offsets to achieve net zero. Other comments noted and we too recognise the importance of collaboration through the DWMPs.
Domestic customer	Household	Y	All households water usage should be metered. We live in North Essex, my neighbour has the sprinkler on permanently at high pressure to water her trees.	Y	Do not have the time to read the rest of your report.	Y	If you are not prepared to have every household metered, there surely should be a guideline set per person say 10% within 120.	Customer would like to see 100% of households with a meter but our draft report states that we are targeting "95% meter penetration." This is because we don't think 100% is practicable, both from a technical and economic perspective. There is a percentage of properties where it simply isn't technically feasible to fit a meter without major disruption to customers and lots of cost. For example, in our region there are lots of multi-occupancy properties which have shared hot water systems where a meter cannot easily be introduced without replacing the internal plumbing. There are also properties where the water rises in the property at multiple points. We currently fit a maximum of two meters at one property; this covers the majority, but not all. Hence, we believe we have metered the bulk of the properties that we can easily reach. We are now approaching the steep part of the "hockey stick" cost curve and need to carefully balance the cost to our customers. In the final report we have clarified what is meant by 'meter penetration' to highlight that the vast majority of households are already fitted with a meter and this will increase further.

Other responses

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Government / Regulator	Defra	We were very pleased to see the bigger picture and more holistic principles represented in the report, particularly in regards to; the interlinkages to the SDGs; the comprehensive understanding of interdependencies and the known implications on other sectors; and the consideration to behaviour change of consumers and users. The key area to perhaps provide further on is in regards to the methodology to access risk within each chapter's metrics section. It is noted that the units of risk represent: 'the likelihood of it occurring and the consequence if it did occur (using definitions from our corporate risk assessment process) for different time horizons', but it would be good to have further info on what the interplay is with the UKCP18 scenarios and what time horizons have been selected.	Documents describing our corporate approach to risk assessment, and a document describing how this has been used for the Adaptation Report, can be made available on request. In summary, and in response to the particular points raised; i) UKCP09 was used as the basis for the assessing the climate-related risks in our Final Business Plan, our current Water Resources Management Plan (WRMP) and elsewhere. As per industry guidance, the medium emission scenario was typically used as a starting point, but other scenarios were also considered. UKCP18 was not available when we started preparing these plans but we are now in the process of updating to UKCP18 and this will be used in our next WRMP and Drainage and Wastewater Management Plan (DWMP) ii) To assess the risks, summarised on page 8 of the draft report, we considered the likelihood and impact of the risk described occurring in the following five-year periods: Inherent = 2040-2045 if nothing was done, Current = 2015-2020, 2025 target = 2020-2025, 2045 target = 2040-2045 iii) CCRA2 was used when deciding how to categorise and report on our risks in a way that would be meaningful both internally and externally.
Other	Consumer Council for Water	You will have seen in our recently published Forward Work Programme for 2020- 2023,that CCW wishes to encourage all water companies to produce a Climate Change Adaptation report. We have seen your (draft) adaptation report , and are pleased to see that you have gone a long way towards addressing the issues that we think will be important to consumers. We believe the Climate Change Adaptation reports are a great opportunity to give consumers confidence that their water company is taking action on one of the biggest challenges we currently face. We will be reviewing all companies' reports from a consumer perspective once they are available, and plan to publish our findings. As part of this analysis we will be looking at how climate change adaptation is embedded in an integral way in companies' business planning. We will also focus on how this is being communicated to consumers. We have written to all water companies in England and Wales, that are yet to produce a report, setting out our expectations in the areas that we believe matter most to consumers. These are set out below. Business planning The upcoming climate change adaptation reports are a great way to bring together regulatory plans such as Water Resources Management Plans (WRMPs), Business Plans, drought plans and Drainage and Wastewater Management Plans, to give an overview of the company's strategy as well as the measures to keep track of progress. We think there is potential to use these adaptation reports as a means to engage with consumers on the challenges faced by the company and its strategy for dealing with them. We would therefore like to see versions of these reports that are consumer facing, engaging, easy to read and easily understood by a wide audience. Ideally, this should be a short summary report alongside the main document. You have the opportunity to use this both as an awareness raising exercise and as a call to action. Managing Risk Companies' understanding and management of risks posed by climate change would have improved and evolved since the previous reports were submitted. It would be beneficial to see this explained in the reports. We would like to understand: · How has better information (for example, UKCP 18, CCRA2, the effect of recent extreme weather events) improved the company's understanding of, response to and mitigation of risk? · How did you establish the 'acceptable' level of risk? Were consumers involved in this assessment? · How do risk levels compare over all risk levels with and without interventions? · How is the company keeping track of progress of any reduction to risk? · How are risks communicated to consumers? Are you helping consumers see that they can play a part to help mitigate these risks? For example (but not limited to) consumer engagement and behaviour change initiatives to reduce water use or sewer misuse to reduce sewer flooding. · What flagship projects or initiatives have you undertaken to manage risks related to adaptation? Building resilience One of the aspects adaptation to climate change can help with is to build resilience to ensure consumers continue to enjoy the reliable and safe water and waste water supplies they highly value. We understand and appreciate that many of these initiatives to build and maintain resilience will require collaborative working with other sectors to achieve wider benefits. In the report, we would like to see examples of: · Any wider benefits that adaptation to climate change can bring to the company and the local community. · How has the company identified and addressed interdependencies with other sectors. What is being done to address any risks deriving from these interdependencies (including emergency response). · What are you doing to overcome any barriers to adaptation that can hinder progress to increase resilience (in the round)? We appreciate companies are at different stages of preparing their adaptation reports, in line with Defra's deadline to submit by December 2021. It would be beneficial to us if you would confirm the timetable you are working to and when you plan to submit your report. It would be helpful if you could send me a copy of the report once it has been published. Please let me know if there is anything you would like to discuss further. Comments following further dialogue: · We now have 2019-20 data available and so we would like to see that reflected in the report, and the narrative should explain if there have been any changes to the risks or mitigation measures as a result of the new data. · In some areas, the narrative of the 2020 report was more focussed on activities that had already taken place, rather than the plans for the future. We feel that the climate change adaptation report should be a balance between what you have done and actions planned for the future. · In some places, there was quite a lot of jargon. We think the overall report could be improved if there was a customer friendly summary document. · Finally, whilst last year's report was very clear on how you would be working with stakeholders to deliver your plans, it was less clear about how you had engaged with stakeholders to develop the plans. We'd also like to see a link between the climate change adaptation report and customer priorities.	**Business planning -** With regard to your comments that "climate change adaptation reports are a great way to bring together regulatory plans", you will note that our Climate Change Adaptation Report has been aligned with, and informed by, the contents of our Water Resources Management Plans (WRMPs), Business Plans, drought plans and Drainage and Wastewater Management Plans. In order to better engage with consumers we put careful thought into the style of the report and made the draft report publicly available for all stakeholders to review and respond. We also included a section on customers, highlighting the potential impact on them and the vital role they can play in helping us to manage the risks. Before and after publishing the draft report we consulted with our online community of customers, which involved 136 participants from a spread of ages, genders and geography, and representing all of our defined customer segments. This was particularly useful in judging understanding, engagement and style of communication. As you recommend, we will also provide a short summary report alongside the final document. **Managing risk -** The report describes how we used UKCP09 for this most recent round of business planning and how we are already working on updating our next round of regulatory plans to UKCP18. The risks we assessed were aligned with both CCRA2 and an early indication of the likely risk descriptors for CCRA3. The report describes the ongoing learning from managing climate-related risks. For example, the summer of 2018 provided learning in how we use our incident rooms and engage additional resources from across the business. The Adaptation Report describes the investments that were promoted through our 2020-2025 Business Plan on the basis of a thorough assessment of risk, cost and benefit which included feedback from customers. Our report provides a high level of assessment of our headline risks and performance and more detail is available in our Business Plan and other plans. The report shows how climate-related risks have changed, and will change, over time. We also regularly monitor climate-related risk on our top-tier risk register. We carried out our most extensive engagement with customers ever in preparing our 2020-2025 Business Plan and this demonstrated their support for climate-related investment. This is particularly clear in their response to our WRMP. Case studies have been provided at the end of the report to demonstrate flagship projects and initiatives undertaken to manage risks related to adaptation. **Building resilience -** The need to both mitigate and adapt to climate change are significant drivers behind the actions described in the Natural Capital chapter. The nature-based solutions described bring wider benefits, such as improved biodiversity, to the local community. The Ingoldisthorpe example referenced in the report also delivered significant financial benefits. A chapter has also been dedicated to describing the interdependent risks and opportunities and how we are working with local and national stakeholders to build resilience. This chapter also describes how policy development can help to overcome barriers.

Type of Organisation	Organisation	Comments	Anglian Water's (brief) response to consultation comments
Domestic customer	Online community	Summary of findings: · Climate Change is front of mind for many customers, but it's grounded in uncertainty. Though a majority of customers are convinced climate change is happening, the level of impact is felt to be unpredictable. · Customer perceive that, due to its geography, East Anglia is at particular risk to some effects. Most regional concerns are around flood and droughts, with the biggest perceived negative impacts being leaving East Anglia without food and water. · Though customers feel a certain responsibility to prevent climate change, they feel it's also up to businesses and government to spearhead the changes and have the biggest impact. · With flood and droughts top of mind, both customers and Anglian Water need to save water. Customers feel they can do their bit, but there a responsibility for Anglian Water to tackle and control big picture risks around water management. · Generally, Anglian Water and councils are seen to be responsible for looking after residents. Though, there is the feeling that both Anglian Water and other companies share responsibility too. · Most feel that Anglian Water's plans to tackle climate change are quite effective. Before issuing the draft Adaptation Report 82% of customers voted 6 or higher on a scale of 1 - 10 (where 10 was highly effective). After issuing the report 87% of customers voted 6 or higher. · When asked for their preference on how to communicate risk (i.e. 1-in-50 or 2%) customers highlighted the need for clear, plain English, the desire to be as informed as possible and favoured BOTH approaches being used · Responses highlighted the opportunity for Anglian Water to be a voice of authority in an uncertain landscape.	Anglian Water has the facility to communicate with an online community of customers. This community was consulted to understand customers' views on climate change and Anglian Water's response. This was done before and after issuing the draft Adaptation Report for consultation. 136 customers participated, with a good spread across age, gender and geography and representing all six of Anglian Water's identified customer segments. Before issuing the draft Adaptation Report we provided a brief summary of Anglian Water's adaptation activities and engaged with the online community as follows: · A discussion to identify the effects of climate change. · A discussion to identify customer behaviour around climate change effects. · A poll to gauge the preferred type of language used by Anglian Water in terms of climate change. · A poll to gauge how effective they thought Anglian Water was at adapting to the effects of climate change The feedback from customers was used to inform the content and style of the draft report issued for consultation. After issuing the draft Adaptation Report we repeated the poll to gauge how effective they thought Anglian Water was at adapting to the effects of climate change.
Other	Anon	One insight I would like to pass on is that I noticed your risk assessment is strongly focussed on physical risks associated with climate change. This makes sense given the nature of the business, although I did feel that the list of transition risks identified was fairly light. I'd usually expect to see things like: · GHG policy changes; · Changes in tax legislation driven by low-carbon goals; · Changes to the wider regulatory or legal environment; · Additional reporting obligations; · Accidental non-compliance with evolving regulatory and legal environment; · Changes to land usage policies; · Changes to values of investments held (e.g. pension fund, energy derivatives); · Reduced demand from customers who become more climate-conscious; · Reputational damage from not meeting green targets (I notice this is highlighted as an opportunity in your risk assessment, but you may want to consider risks associated with e.g. inaccurate data resulting in you misrepresenting yourselves).	Report modified to clarify that Anglian Water is exposed to, and manages, numerous transition risks. The most significant have been described in the report, i.e. financing and energy/carbon costs. In managing these two risks we effectively manage most of the other transition risks described by the TCFD. NB this is the first of our Adaptation Reports to make transition risks explicit.
Local Authority	Anon	This response has 3 sections · Flooding · Sewer Flooding · Nature Conservation Flooding Chapter 3: Risk to services from flooding 3.1 -Surface water poses the biggest risk to Anglian Waters Assets but it is also the easiest of the three key areas of flood risk to tackle as there are likely to be a range of small scale interventions that can be put in place. These interventions can help to reduce flood risk for residents as well as key elements of drainage infrastructure. We believe that it is key to ensure that any investment in the protection of these assets considers the wider risk of flooding in an area rather than just protecting specific assets. This will be key to attracting partner investment. 3.2 - While the measure taken so far to protect assets are sound as we move forward into a age of increased uncertainty flood mitigation and resilience measures should look at scheme that allow adaptability in the future to maximise the value of current investments. Partnership Funding - We are very pleased to be working closely with Anglian Water on a number of schemes across the county and hope to continue this relationship into the future as we as it provides real benefits to residents and customers that would not otherwise be achievable without working in partnership. The text in this paragraph should be updated to make it clear that the example on page 63 relates to work on Canvey Island, not Clacton. Updated Flood Risk Assessment: as modelling improves across the region it is important to build this updated data into any asset risk assessment. Additionally linking this data to the information that is available to partners about residential risk will help to better identify joint funding opportunities. 3.5 - While we understand the need use metrics with a focus on asset protection, this should not be the sole factor when determining scheme priority as there will be range of factors while which have a greater impact on partnership funding opportunities. Sewer Flooding With regards to the Sewer Flooding section of the Report, below are some comments on this: This section relates to the Risk of Sewer Flooding (Hydraulic overload), across the network and how Anglian Water are planning to manage this issue moving forward: Section 2.1 Understanding the Risk: It states that the current number of Anglian Waters customers at risk of Sewer flooding in a 1-in-50-year storm is 14.31 % and the aim is to reduce this to 9.75 % by 2024/ 25, but to 0% in the 'Long Term'. A diagram is shown indicating a downward trend in sewer flooding leading to internal/ external flooding of property between 2012 and 2019. 80% of sewer flooding incidents are due to blockages, however there are also the impacts of predicted Climate Change that also need to be considered/ addressed.	**Risk to services from flooding** We understand and accept the comments about the value of understanding and managing our flood risk within a wider context and are committed to continuing to work with the local authority. We will continue to work together to build stronger business cases for partnership funding through how we link our asset risk data with other data, including residential risk. Our approach to collaboration, including partnership funding and our role as a Risk Management Authority is described throughout the report. The text has been modified to make it clear that the example on page 63 relates to work on Canvey Island, not Clacton. **Sewer Flooding** We are pleased to have worked with this local authority over the past five years to implement schemes that will have a benefit to our customers and the environment, and we look forward to continuing to work in these areas to reduce the risk of sewer flooding. **Natural capital** We agree with the comments around natural capital, and are keen to explore the multiple benefits that can be delivered through taking an integrated approach to natural capital delivery, whether this be for SuDS, natural flood management, inland or coastal green infrastructure or habitat creation. We will continue to explore partnership opportunities to deliver natural capital schemes that enable us and our partners to create resilient habitats that deliver for our customers and the environment. Having signed the Water UK Public Interest Commitment in April 2019 and changed our Articles of Association in July 2019 to enshrine our commitment to working in the public interest and putting environmental and community considerations at the heart of our decision making, we have committed to co-create a "Social Contract" with our customers. Over the past year we have been working to develop this two-way social contract with our Online Customer Community, customer focus groups across our region and our Customer Engagement Forum. This outlines the social and environmental challenges that we all face, makes our commitments to reaching a sustainable future clear and seeks the support of customers and communities across the region in meeting these challenges. Ensuring that we are resilient to climate change was key and customers were clear that they wanted to play their part. This contract will be published by early 2021.

Type of Organisation	Organisation	Comments	Anglian Water's (brief) response to consultation comments	
Local Authority	Anon	Section 2.2 Actions taken to address the Risk: The report identifies 5 key areas to address sewer flooding and these are through the Water Recycling Long Term Plan, Designing New Sewers to accommodate Climate Change, Behaviour Change (i.e. The 'Keep It Clear campaign' which provides customers with advice on how to properly dispose of fats, oils and grease etc. so that sewers don't become blocked); Sustainable Drainage to slow/ reduce water entering the sewer network and Collaboration with other RMA's (i.e. Supporting LLFA's with delivery of SWMP's and involving LLFA's in Drainage and Wastewater Management Plan's (DWMP)). Section 2.3 Planned Actions: £50 million is earmarked in AW's business plan to flooding and consideration will be given to; Providing storage by upsizing our existing system, Increasing investment in property-level protection and Beginning delivery of a multi-AMP Surface Water Management Plan between 2020 and 2025. Anglian Water is still legally obliged to accept all new connections to the existing sewerage infrastructure, however will continue to work with Local Planning Authorities on new development coming through the planning process and conditioning the connection to surface and combined sewers where this cannot be avoided completely. In terms of impact on the team, this is an important area to consider for Additional Funding and delivering Multiple-benefits for Flood Alleviation Schemes delivered the Capital Program. Retrofitting of SUDS can also have a significant impact on slowing/ reducing discharge into sewers which would help contribute toward Anglian Waters aims of reducing sewer flooding, as well as delivering the additional SuDS/ Green Infrastructure benefits we are looking to achieve (i.e. Make Rain Happy for example). We could also support AW in protecting their customers through the PFR program, if larger scale capacity increasing projects are not feasible. In terms of New Development, we work to a discharge hierarchy approach where discharge to SW/ Combined sewers is the least preferential option and if this is necessary then discharge is restricted to the 1 in 1yr Greenfield rate and also subject to approval by the relevant water authority. In the case of Brownfield sites discharging to existing SW/ Combined sewers, we also require a minimum 50% betterment on existing discharge rates so reducing risk of flooding from sewers is well reflected in our current standards/ practice for SUDS provision. We have been contributing toward Anglian Waters Drainage and Wastewater Management Plan's (DWMP), so involvement in this is ongoing and we have been actively engaging with Water Authorities on delivery/ production of the Surface Water Management Plan's and highlighting opportunities in the area of reducing sewer flooding. Climate risks to Nature Conservation (NC) Agree with the risks mentioned within the report of climate change impact on biodiversity, habitat fragmentation and invasive non- native species. Another consideration of risk is the changes to the habitat that will effect the biodiversity it supports - for example, fresh water marshland becomes salt water marshlands etc. Actions There are no objects to the actions proposed and support the move towards 10% increase in biodiversity net gain and the use of natural solutions through creation of wetlands and tree planting vis the Water Industry Natural Environment Programme. However, it is not clear how this programme with prevent/mitigate habitat fragmentation and/or manage invasive non-native species. There needs to be a more joined up approach with flood and water malmanagement through the more naturalise designs for Sustainable Drainage Systems. Watercourses and SUDs to provide multifunctional green infrastructure (GI) and naturalised design to enhance NC, that also provide safe public access, enhance aesthetics and amenity value. It is important to recognise the significant opportunities GI provides to deliver climate change adaptation and mitigation - i.e. space for water and natural options for water resource and flood management. GI can contribute to making areas less vulnerable to flood risk whilst ensuring development doesn't increase flood risk to third parties, through its key role in · sustainable drainage; · drought mitigation; · flood and water stress reduction; · providing opportunities for attenuation or infiltration that can help to recharge aquifers; · maintaining levels in watercourses or other blue infrastructure features. · influence water quality through limiting diffuse pollution and controlling water levels in watercourses Natural flood management involves techniques that aim to work with natural features and characteristics to manage the sources and pathways of flood waters, rather than through engineered process. Techniques could include for example: · The creation of water gardens · Green roofs and walls · Bio retention areas · Coastal and estuary management (i.e. saltmarshes) · Woodland creations and leaky dams · River restoration (natural meanders and bank profiles) The report mentions the coast but no reference under natural capital. There are several types of coastal GI that provide protective services that can help reduce vulnerability and enhance resilience to these pressures often referred to as living shorelines, that can help improved water quality, aquatic habitat, and carbon sequestration. These primarily include (but are not limited to): · Saltmarshes. Coastal wetlands that form in saline tidal zones along protected shorelines. · Ridges of material submerged at or below sea, estuarine, or river surfaces. For example, biogenic (composed of organisms such as mussels and oysters) or geogenic (composed of rock, sand, or other inorganic substrates). · Seagrass beds. Submerged aquatic vegetation that grows in shallow marine and estuarine habitats. · Sand beaches and dunes. Deposits of sand and gravel shaped by waves, wind, and coastal vegetation.		

Type of Organisation	Organisation	Comments	Anglian Water's (brief) response to consultation comments
		Partnership It mention Norfolk River Trust and embellishment of Natural Capital East, but it does not mention who the partners are they are currently working with. Partnership working opportunities: · Lead Local Flood Authority · Partners on green and blue Infrastructure projects · Developers and planners- to ensure developments incorporate naturalised solutions in their designs to help meet the NC targets within the strategy. · Wildlife Trust and RSPB (coastal) to monitor biodiversity net gain and to help protect habitats. Other It would be useful to signpost to relevant legislation I.e. 25 Year Environment Plan and Environment Bill and how this will drive forward the AW NC programme.	

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