



Anglian Water's response to the Call for Evidence on Critical National Infrastructure and Climate Adaptation.

25th February 2022

Introduction to Anglian Water and our reason for submitting evidence

Anglian Water is the largest water and water recycling company in England and Wales by geographic area. We supply water and water recycling services to almost seven million people in the East of England and Hartlepool. In 2019 Anglian Water became the first UK utility to change its company constitution – our Articles of Association – to lock public interest into the way we run our business, both for now and for future generations. Our purpose as a water company, enshrined in our Articles, is *to deliver social and environmental prosperity to the region we serve by our commitment to Love Every Drop* (a reference to our corporate strategy that aims to put water at the heart of a whole new way of sustainable living).

By changing our Articles, our directors are duty-bound to balance shareholders' expectations of legitimate returns with the long-term best interests of our customers, employees, suppliers and the environment. We are now working with the BSI, CISL and a range of partners to codify this approach so that others can adopt it too. In essence we are building on the success of the B-Corp movement by tailoring it to the needs and obligations of large infrastructure companies like us.

We've been a leading voice in responsible business for several years and were named Business in the Community's Responsible Business of the Year in 2017. In April 2020 we launched a £1 million Positive Difference Fund to support front-line Covid-19 relief efforts. We've been awarded the Queen's Award for Enterprise: Sustainable Development to hold for a further five years from 2020; our strong track record has helped us forge a leading path in sustainable financing for utilities.

This call for evidence is relevant to us because we are owners of multiple CNI sites across our region in the form of water treatment works and water recycling centres. We supply water and water recycling services to almost seven million people in the East of England and Hartlepool, as well as many businesses (some are CNI themselves).

1. Key vulnerabilities and levels of preparedness of UK CNI to extreme weather events and other effects of climate change, including:

a. The possible compound effects of such events

Anglian Water has several unique geographic challenges which make us vulnerable to climate change. These include a low-lying landscape and a very flat topography which present us with a unique vulnerability to flooding from the coast, from our rivers, and from periods of extreme rainfall. Anglian's region also has a long, exposed coastline further increasing risk from sea level rise and flooding.

In stark contrast to this, Anglian Water also operates in the UK's driest region, which includes not only three of the UK's fastest growing cities (Peterborough, Cambridge, Milton Keynes), with increasing demands for water but also produces a large share of the UK's food. This means that

climate change and water scarcity has been a core focus for us since the early 1990s. Climate models tell us that weather patterns due to climate change will result in less rainfall in our region at certain times of year.

A key focus area for Anglian is reducing the water lost through leaking pipes. We are making good progress to reduce our leakage figures however the winter can be a busy time for leakage teams as water pipes freeze, expand and burst in very cold weather. Recent research has predicted that as temperatures rise we might see a smaller number of pipes freezing and less water lost for this reason. However, if temperatures increase, we might see more summer pipe bursts because of soil shrinkage and extremely hot weather. In terms of compounding effects this could be significant, as water losses from burst pipes are more concerning in the summer when peak summer demand for water is at its highest and rainfall is lowest.

As a water company our operations are intrinsically linked to the weather and we expect extreme weather to become more frequent because of climate change, increasingly the likelihood that multiple risks will happen concurrently. An example of what we might see is storms and heavy rainfall events causing flooding in our region at the same time as we also experience power outages, making it difficult to maintain our operations. Defra ask that we protect our CNI sites from such risks where possible, for example, we ensure we have power resilience through the use of generators.

b. The interdependencies between different aspects of UK CNI

Anglian Water ensures a strong level of preparedness and pre planning regarding the interdependencies of other CNI. However, the water sector has a direct line of dependency on chemical production, transportation, communications and energy sectors, without which we would find delivering our services very challenging.

Reversely, there are sectors which rely on us for water supply. For example, the food sector has direct reliance on water for production and processing as well as other CNI such as energy cooling and oil refineries. There are several circular dependencies between CNI sites which we are involved in.

We are also aware that the expansion of the hydrogen economy could put a massive demand on the water sector as this energy source emerges and becomes more widespread. The water sector will be crucial to enable the hydrogen economy but will only be able to do this if the right planning and forward looking is done to manage this new demand for water.

c. Supply chain vulnerabilities

Our supply chain resilience approach is embedded into our sourcing processes and procedures. All contracts are assessed for criticality, and suppliers are assessed at contract let and throughout the contract on a series of measures. This includes both financial resilience and whether suppliers hold certifications for ISO22301 or other management systems. Where necessary, in-depth reviews of continuity arrangements are also undertaken. Our chemicals supply chain is also subject to greater monitoring and oversight; we actively participate in the Water UK incident management structures including the National Chemicals Steering Group and we work with our suppliers to understand and mitigate risks to our critical chemicals.

There are other crucial resources we rely on to function as a business such as a healthy work force (potentially put at risk by future pandemics) and secure IT systems (which we work very hard to protect from cyber risks).

d. Recent 'near miss' scenarios

In 2018, one of our water treatment site assets failed, we were able to continue to provide water to a business customer who was another CNI but the turbidity in the water effected their processes. We gathered and implemented several lessons learnt and improvements following this near miss. We established an alert system with the EA for any issues in the water course (river) network. We also now have a specific plan in place for this CNI customer going forward.

Lessons were also learnt following the Covid-19 pandemic which resulted in Anglian Water adopting a J cell military approach to managing a crisis. This approach groups staff into 'cells' to effectively manage lines of communication for decision making and passing information around the business. This has enabled us to manage the ongoing impact of Covid-19 to ensure resilience and risk is managed at an organisational level. We also published our [Green Recovery Plan](#)¹ which aimed to make sure we keep and build on the positive changes that were seen in the pandemic, and work to help the country thrive again.

2. What might constitute an 'acceptable' level of resilience to climate change within UK CNI, both to near-term risks and longer-term uncertainties or 'tipping points', and the obstacles to achieving it?

Climate change is occurring now. The language of 'preparing' for climate change could be unhelpful as it suggests it's not already taking place and adding to the scale of present-day threats. However, we appreciate that the future impacts of climate change are largely uncertain, and we must plan for them, considering both mitigation and adaptation to climate change in a joined-up way. For more information about Anglian Water's approach to adapting to climate change please see our [Adaptation Report](#)².

As a water sector, and as a nation we need to be resilient to more widespread and frequent flooding and drought in context of climate change. Projections of sea level rise are already to an extent 'locked in' and there is a chronic, systemic risk to the east of England by the end of the century. 28% of the Anglian Water region is already below sea level, and communities are reliant in many cases on ageing flood and coastal protection assets. Therefore, from a water company perspective, **tipping points** are related to risks which prevent us maintaining drinking water supply and carrying out sewage treatment responsibilities.

Other tipping points relate to interdependencies with energy and chemical supply chains. We wouldn't be able to operate as a business without these services, so our resilience to climate change also depends on the resilience of our supply chain.

In terms of an acceptable level of resilience this would come far before the tipping points related to us maintaining supply. As set out in our [Strategic Direction Statement](#)³ we've talked to our customers about what matters most to them, and about our role in the region and we set four long-term ambitions to help guide our planning:

1. Enable sustainable economic and housing growth

¹ Anglian Water's Green Recovery Plan (2021) <https://www.anglianwater.co.uk/about-us/our-strategies-and-plans/green-recovery-plan/>

² Anglian Water's Climate Change Adaptation Report (2020) <https://www.anglianwater.co.uk/siteassets/household/in-the-community/climate-change-adaptation-report-2020.pdf>

³ Anglian Water's Strategic Direction Statement (2020) <https://www.anglianwater.co.uk/siteassets/household/about-us/pr19-01-strategic-direction-statement.pdf>

2. Be a carbon neutral business by 2050 (now updated to 2030 in our [Net Zero Strategy](#)⁴)
3. Be resilient to the risks of drought and flooding
4. Make significant improvement in ecological quality

These commitments, along with our purpose *to deliver social and environmental prosperity to the region we serve*, demonstrate our dedication to making the East of England resilient to climate change and a thriving place to live. We wanted to make our longstanding commitment to working in the public and Environmental interest crystal clear. So, in 2019 we made legally binding changes to our company constitution, enshrining this public purpose for the long term. Our social and environmental purpose shapes how we work every day⁵.

We believe all these goals and commitments will help deliver resilience to our region.

3. The effectiveness of Government policy, legislation and implementation frameworks for managing national security risks arising from climate change, including those emerging within the private sector

As a result of Brexit and Covid risks the water industry have proactively established an escalation process known as NIM and PIM escalation through Water Industry networks. These processes help us manages risks (including simultaneous risk), mitigations (such as mutual aid responses) and impact.

We would like to see the government consider the impact of overlaying, simultaneous risks and do more to support in these instances. For example, we would like to see regulatory bodies better recognise the need for flexibility during multiple risk situations and take a proactive approach to support organisations responding to them. We would also like to see more national, Government led, consensus on climate change scenarios to plan for and the impact on water availability (specifically in our region), so that we can better understand the cumulative and interdependent risks and best prepare for them.

Finally, we would like to see the Government define and set minimum levels of resilience that infrastructure providers can work toward. For example, as a water company we should have confidence that the power grid will be similarly resilient across our region rather than being more prone to failure in some areas than others, with consequential impacts for our assets and services.

4. Allocation of roles and responsibilities at the national, devolved and local level, and the connections between them

We would like to see a more consistent approach within Local Resilience Forums (LRFs). Within the Anglian Water region, we work with 13 LRFs who all take a slightly different approach and use different templates for risk assessments. We would also like to better understand the role of other Category 2 responders and the capability they have. LRFs could be mandated to consider risks identified through the planning system to ensure this statutory requirement to assess risk as part of considering development options is produced once – by Councils and developers – and cascaded to local partner.

No one organisation is directly accountable for taking the lead in response to surface water flooding incidents. This is a clear gap in emergency response arrangements. The Environment Agency leads

⁴ Anglian Water's Net Zero Strategy (2020)

<https://www.anglianwater.co.uk/siteassets/household/environment/net-zero-2030-strategy-2021.pdf>

⁵ Anglian Water's Social Contract Report (2021) <file:///C:/Users/lydia/Downloads/aw-social-contract.pdf>

on the response to coastal flooding and from designated main rivers but flooding from surface water and smaller watercourses is left to the local council's discretion. We have created [this](#) 'Who to contact in a flood' webpage to try to make things clearer for the customer.

In the case of drought and management of water resources, we have 5 yearly Water Resource Management Plans in place for our region and a [drought plan](#)⁶ as part of our statutory requirements. We work closely with Water Resources East for regional support and support their partnership approach to managing water resources in the long term.

We would like to see a co-ordinated and central contact list of local CNI sites and suppliers which can be accessed in a crisis.

5. The role of the Government's forthcoming National Resilience Strategy, particularly in addressing opportunities for (and obstacles to) improved resilience among CNI providers

We responded to the previous Cabinet Office call for evidence on the National Resilience Strategy in Autumn last year and made it clear that we would like to see the dependencies and interdependencies between sectors, organisations and at an individual asset level highlighted in the proposed vision. We also said we would like to see the risk of concurrent events acknowledged, for example over the winter of 2020 when Anglian Water was simultaneously dealing with severe weather and flooding across the region as well as the Covid pandemic.

We are also responding to Defra's Criticality Review currently.

6. The extent and effectiveness of UK-wide monitoring and early warning systems

At Anglian Water we use modelling, worst case scenario planning, guidance from the regulator and any available intel to inform our decision making. We also share experiences and learnings with other water companies through industry networks such as via Water UK.

Currently we feel we have appropriate early warning systems set up with the Met Office data, EA flood alerts, ground water data (river levels, borehole levels, soil moisture deficit) and more. However, as climate change takes effect early warning systems would need to be adjusted to allow more time for responses to the increased risk – e.g. larger flooding or longer dry periods than we have dealt with previously. Additionally, the further in the future we look, the more uncertainty there is around climate change predictions and future risks, so our requirements for early warning systems might change.

7. The opportunities presented by technological solutions (such as AI and digital twins) for anticipating and managing the implications of climate change for CNI.

Anglian Water, in partnership with UKPN and BT have been working on the [Climate Resilience Demonstrator \(CReDo\)](#) project led by the National Digital Twin Programme (NDTp). Anglian Water, UKPN and BT have shared data such that the CReDo digital twin brings together this data to present a picture of the interdependencies across these networks.

Flood data can be run through the CReDo digital twin to show the impact of flooding on these interdependencies to understand which assets would fail and how asset failure can propagate through the infrastructure system causing system wide outages. Such a picture can then inform the appropriate interventions, such as increasing the level of flood defence, relocating the asset or

⁶ Anglian Water's Revised Drought Plan (2021) <https://www.anglianwater.co.uk/about-us/our-strategies-and-plans/drought-plan/>

increase back-up power capability to protect assets in advance of such extreme weather events happening and to prioritise maintenance at certain critical sites.

The opportunities presented by CReDo are considerable. The CReDo digital twin currently works with static asset data but could be developed further in the future to work with live data to inform a real time response to extreme weather events caused by climate change. Furthermore, the system could also be expanded to include a broader range of data sets from the existing participant infrastructure operators, include a greater range of infrastructure providers and examine a greater range of climate change scenarios. More detail on the CReDo project can be found in the submission of National Digital Twin programme, Centre for Digital Built Britain as the lead organisation.