Building a zero-carbon economy – Call for Evidence

Background

On 15 October 2018 the governments of the UK, Scotland and Wales asked the Committee on Climate Change (CCC) to provide advice on the UK and Devolved Administrations' long-term targets for greenhouse gas emissions and the UK's transition to a net zero-carbon economy. Specifically: when the UK should reach net zero emissions of carbon dioxide and/or greenhouse gases as a contribution to global ambition under the Paris Agreement; if that target should be set now; the implications for emissions in 2050; how such reductions can be achieved; and the costs and benefits involved in comparison to existing targets.

The advice has been requested by the end of March 2019.

The UK's long-term emissions target is currently for at least an 80% reduction in greenhouse gas emissions from 1990 to 2050. It covers all sectors, including international aviation and shipping and is measured on a 'territorial' basis (i.e. based on emissions arising in the UK). On a comparable basis, emissions in 2017 were estimated to be 38% below 1990 levels.

The current target was set in 2008 based on advice from the Committee. That advice considered that to avoid the worst impacts of climate change, the central expectation of global temperature rise should be limited "to, or close to, 2°C", while the probability of crossing "the extreme danger threshold of 4°C" should be reduced to an extremely low level. That meant global emissions would roughly have to halve by 2050. The 2008 advice made the assumption that the UK should not plan to have a higher level of per capita emissions in 2050 than the global average.

The long-term target guides the setting of carbon budgets (sequential five-year caps on emissions that currently extend to 2032 and require a reduction in emissions of 57% from 1990 to 2030). Both the 2050 target and the carbon budgets guide the setting of policies to cut emissions across the economy (for example as set out most recently in the 2017 Clean Growth Strategy).

Any change to the long-term targets would therefore be expected to have significant implications, not just in the long-term but on current policies to drive the transition.

The CCC will advise based on a thorough consideration of the relevant evidence. We expect that to cover:

- The latest climate science, including as contained in the IPCC Special Report on 1.5°C.
- The terms of the Paris Agreement.
- Global pathways (including those reported by the IPCC) consistent with limiting global average temperature rise in line with the goals of the Paris Agreement.

- International circumstances, including existing plans and commitments to cut emissions in other countries, actions to deliver on those plans and opportunities for going further.
- An updated assessment of the current and potential options for deep emissions reductions in the UK and emissions removals from the atmosphere, including options for going beyond the current 80% target towards net zero.
- An appraisal of the costs, risks and opportunities from setting a tighter long-term target.
- The actions needed in the near term that would be consistent with achieving the long-term targets.

This Call for Evidence will contribute to that advice.

Responding to the Call for Evidence
We encourage responses that are brief and to the point (i.e. a maximum of 400 words per question, plus links to supporting evidence, answering only those questions where you have particular expertise), and may follow up for more detail where appropriate.

You do not need to answer all the questions, please answer only those questions where you have specific expertise and evidence to share. It would be useful if you could use the question and response form below and then e-mail your response to: communications@theccc.gsi.gov.uk using the subject line: 'Zero carbon economy – Call for evidence'. Alternatively, you can complete the question and answer form on the CCC website, available here.

If you would prefer to post your response, please send it to:

The Committee on Climate Change – Call for Evidence
7 Holbein Place
London
SW1W 8NR

The deadline for responses is 12 noon on Friday 7 December 2018.

Confidentiality and data protection
Responses will be published on our website after the response deadline, along with a list of names or organisations that responded to the Call for Evidence.

If you want information that you provide to be treated as confidential (and not automatically published) please say so clearly in writing when you send your response to the consultation. It would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

All information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 1998 and the Environmental Information Regulations 2004).

Question and response form

When responding, please provide answers that are as specific and evidence-based as possible, providing data and references to the extent possible. Please limit your response to a maximum of 400 words per question.

Part 1: Climate Science

Question 1 (Climate Science): The IPCC's Fifth Assessment Report and the Special Report on 1.5°C will form an important part of the Committee's assessment of climate risks and global emissions pathways consistent with climate objectives. What further evidence should the Committee consider in this area?

ANSWER: The Committee UKCP18 should consider the data now available from UKCP18. This can be used to gain an understanding of the impact of going beyond 2°C of warming. Policy makers and businesses like our own must use this to inform their mitigation targets and adaptation activities recognising the risk to achieving a 1.5°C and even 2°C outcome.

Our Water Resources Management Plan was developed prior to the launch of UKCP18 and used the approach defined by the Environment Agency in 2017 for 'Estimating impacts of climate change on water supply.' Using this approach we established that climate change will account for ~19% of the reduction in our supply-demand balance to 2045. This has driven a significant investment in the period 2020-2025 in particular.

Question 2 (CO_2 and GHGs): Carbon dioxide and other greenhouse gas gases have different effects and lifetimes in the atmosphere, which may become more important as emissions approach net-zero. In setting a net-zero target, how should the different gases be treated?

ANSWER: All greenhouse gases are important and need to be reduced and removed as quickly as possible as part of an overall net-zero target.

Anglian Water has set a target to be operationally carbon neutral by 2050, and we are on target to achieve this. Our approach is to reduce all significant greenhouse gases that are within our control to reduce or remove. This includes carbon dioxide, methane and nitrous oxide. In 2017/18, carbon dioxide equated to 83%, methane 11% and nitrous oxide 6% of total Anglian Water emissions

Part 2: International Action

Question 3 (Effort share): What evidence should be considered in assessing the UK's appropriate contribution to global temperature goals? Within this, how should this contribution reflect the UK's broader carbon footprint (i.e. 'consumption' emissions accounting, including emissions embodied in imports to the UK) alongside 'territorial' emissions arising in the UK?

ANSWER: At a national level we believe the UK should align with the agreed global methodology for measuring and reporting emissions. If all countries, sectors and organisations adopt the principle of science based targets to reduce emissions, then challenges around assessing appropriate contributions will significantly reduce.

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Anglian Water's approach is to measure, manage and reduce both operational and capital carbon recognising that the principle of 'reduce carbon reduce cost' provides significant business efficiency, sustainable environmental solutions and benefits to our circa 6m customers.

Through measuring and reducing scope 1, scope 2 and significant scope 3 (capital carbon) emissions, Anglian Water is successfully mitigating both consumption and territorial emissions. The fact that one tonne of carbon emitted anywhere around the planet has the same impact is fully understood and acted upon.

Question 4 (International collaboration): Beyond setting and meeting its own targets, how can the UK best support efforts to cut emissions elsewhere in the world through international collaboration (e.g. emissions trading schemes and other initiatives with partner countries, technology transfer, capacity building, climate finance)? What efforts are effective currently?

ANSWER: We believe that if the UK continues to set ambitious greenhouse gas reduction targets this in itself will support efforts to cut emissions elsewhere in the world. The CCC itself recognises that many countries have introduced their own legislation based on the Climate Change Act (e.g. Sweden).

Anglian Water has further evidence that UK leadership on carbon is supporting efforts to cut emissions elsewhere in the world.

> Standards - PAS (Publicly Available Specification) 2080 is the world's first specification for managing whole life carbon in infrastructure. It is one of the outputs of the UK's Infrastructure Carbon Review developed jointly by UK government and industry. The review was endorsed by organisations working globally and the standard will support efforts to cut emissions elsewhere in the world.
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> Finance – In 2017 Anglian Water became the first public utility to launch a £250 million Sterling Green Bond. Since then we have launched a second Green Bond. In part this has been made possible by the leadership and ambition we have shown on carbon. Encouraging a high-level of ambition on carbon and climate change (e.g. the Task Force on Climate-related Financial Disclosures) within the UK's financial systems will inevitably raise the expectations of international investors and help to drive emissions reductions elsewhere in the world.
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> Innovation & Technology – Anglian Water has used ambitious carbon targets to disrupt established 'good practice' and open up new and even better ways of working. Stretching capital carbon targets have transformed how we work with our supply chain and delivered significant financial efficiencies. Many of our supply chain partners work internationally and consequently can transfer this learning abroad. Our carbon neutral goal is also helping to drive innovation in our Shop Window and international recognition is enabling the transfer of this innovation and technology.

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Advocacy – Anglian Water and other leading businesses should be encouraged to collaborate through organisations like The Prince of Wales's Corporate Leaders Group (CLG) to advocate for greater ambition on climate change. This advocacy is helping to cut emissions elsewhere in the world through the sharing of best practice with policymakers and businesses.

Question 5 (Carbon credits): Is an effective global market in carbon credits likely to develop that can support action in developing countries? Subject to these developments, should credit purchase be required/expected/allowed in the UK's long-term targets?

ANSWER: Achieving Anglian Water's carbon-neutral goal is not reliant on carbon credits and emissions offsetting. Instead we are motivated by the need to respond to the global and local risk and the opportunity brought about through resource efficiency. Reductions in carbon and cost are being achieved despite the administrative burden of some of these schemes.

For example, prior to the inclusion of Grafham Water Treatment Works, one of our biggest sites, into EU ETS we were already committed to ambitious carbon reductions. At Grafham we continue to invest in energy efficiency and the site will soon host our largest solar installation.

Part 3: Reducing emissions

Question 6 (Hard-to-reduce sectors): Previous CCC analysis has identified aviation, agriculture and industry as sectors where it will be particularly hard to reduce emissions to close to zero, potentially alongside some hard-to-treat buildings. Through both low-carbon technologies and behaviour change, how can emissions be reduced to close to zero in these sectors? What risks are there that broader technological developments or social trends act to increase emissions that are hard to eliminate?

ANSWER: The water industry's carbon footprint is significant. Most of it is due to the energy required to treat and pump water and sewage. Growth, tighter quality standards and climate change are driving increases in operational and capital carbon. Despite these challenges leading companies like Anglian Water have committed themselves to carbon neutrality and ambitious reductions in capital carbon. Since 2010 we have saved over 300,000 tonnes of capital carbon, and the equivalent of over 79,000 tonnes of operational carbon annually alongside a 23% reduction in cost.

These reductions are being achieved by setting stretching goals and aligning our business and supply chains to deliver both financial efficiencies and carbon reductions – as described in PAS (Publicly Available Specification) 2080. Changes are required to policy and practices to unlock greater volumes of renewable energy particularly from low carbon heat, onshore wind and the co-digestion of sewage sludge with other organic wastes

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(including agricultural wastes).

Whilst the water industry's carbon footprint is significant, it accounts for a relatively small proportion of the overall carbon footprint of the water cycle. The majority of the carbon emissions are associated with using, and in particular heating, water in the home. This reinforces the need to renovate our existing building stock to make it more energy and water efficient. Anglian Water has collaborated with the Prince of Wales's Corporate Leaders Group (CLG) on a report which highlights that buildings are responsible for 36% of the carbon emissions in the EU; 97% of which are inefficient, and that at least three quarters will still be in use in 2050. Actions to address this are recommended in the report. Above all, water and energy efficiency should no longer be looked at separately of one another if the UK is to continue its global leadership in carbon reduction.

Question 7 (Greenhouse gas removals): Not all sources of emissions can be reduced to zero. How far can greenhouse gas removal from the atmosphere, in the UK or internationally, be used to offset any remaining emissions, both prior to 2050 and beyond?

ANSWER: The message which appears in key reports (including Intergovernmental Panel on Climate Change (IPCC)) is that it is preferable to reduce greenhouse gases rather than rely on untested technologies. Nonetheless many normative scenarios rely on removal technologies such as Bio-energy with carbon capture and storage(BECCS) in order to meet pre-defined targets. Anglian Water is absolutely committed to reducing it's greenhouse gas emissions and has no direct experience of BECCs.

Question 8 (Technology and Innovation): How will global deployment of low-carbon technologies drive innovation and cost reduction? Could a tighter long-term emissions target for the UK, supported by targeted innovation policies, drive significantly increased innovation in technologies to reduce or remove emissions?

ANSWER:

In showing leadership through challenging our supply chain to deliver low carbon solutions and creating a commercial model and culture that encourages collaboration, we have seen innovation being the engine that delivers low carbon low cost solutions. Therefore, business innovation will be critical to meeting long-term UK emissions targets.

The HM Treasury Infrastructure Carbon Review and PAS2080 Carbon Management in Infrastructure describe the leadership and framework required for innovation across an aligned value chain to respond tighter long term emissions target.

Question 9 (Behaviour change): How far can people's behaviours and decisions change over time in a way that will reduce emissions, within a supportive policy environment and sustained global effort to tackle climate change?

ANSWER: Anglian Water's success in reduced operational carbon emissions in line with ISO-14064 since 2010, and reducing capital carbon by 58% in 2018 from a 2010 baseline, is heavily dependent on delivering behaviour change within our business and wider supply chain.

The critical question of why reducing emissions is the starting point in influencing peoples' behaviour and decision making. For example, in 2006 Anglian Water made clear that the two biggest challenges the company faced for the next 25 years was climate change and population growth. Action was needed due to 28% of the region being below sea level, being the driest region in the UK with 2/3rds average annual rainfall, and as one of the fastest growing populations with an additional 1 million people to supply water and water recycling services to by 2050. The vision, tone and communication to employees, the supply chain and customers repeated the clear message of why action was and is needed to reduce emissions.

This what followed up with targeted communication highlighting success stories in reducing carbon and reducing cost, to illustrate the behaviours expected and actions individuals and teams could take to reduce emissions.

The Anglian Water behavioural framework that has successfully challenged behaviour and improved decision making over time is reflected within PAS 2080 carbon management in infrastructure.

The story in the UK around plastics also follows this same principle in communicating with clarity a call for action to reduce single use plastics, explaining why this is important and examples of actions people can take.

Question 10 (Policy): Including the role for government policy, how can the required changes be delivered to meet a net-zero target (or tightened 2050 targets) in the UK?

ANSWER: Given the success and the recognised platform for international leadership that the Climate Change Act 2008 provides, a net-zero target of 2050 is entirely achievable if the same innovative and pragmatic government policy is embraced.

The UK government must bring forward a more ambitious clean growth strategy and set of policies that will achieve the fourth and fifth statutory carbon budgets. It also needs to provide investors with clarity over the long-term framework for investment in renewable energy technologies, low carbon heat, and energy efficiency for at least the decade ahead.

Government muscle must be used more effectively to demonstrate and stimulate the kinds of changes needed to meet the 2050 target, particularly through its procurement and its infrastructure projects. The government should demand low carbon solutions to work towards carbon neutral infrastructure by 2050. Equally, in its procurement, there should be mandated carbon targets across the public estate, robust governance to challenge design solutions, and to report success in cutting carbon and cost.

Elsewhere, we would welcome action on:

- Carbon measurement and reporting, including the Carbon Reduction Commitment and Energy Savings and Opportunities Scheme (ESOS), which have been

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ineffective for many infrastructure organisations.

- The adoption of the principles in the HMT Infrastructure Carbon Review, supporting an aligned value chain.
- Further measures to support industries delivering low carbon solutions, such as off site construction.

Part 4: Costs, risks and opportunities

Question 11 (Costs, risks and opportunities): How would the costs, risks and economic opportunities associated with cutting emissions change should tighter UK targets be set, especially where these are set at the limits of known technological achievability?

ANSWER: As stated by the Committee on Climate Change the forecasts in 2008 of the costs to reduce greenhouse emissions have proven to be inaccurate, with the actual costs far lower than expected, as the long-term goal has resulted in the investment needed to drive down costs of renewables and other technologies.

In 2010 Anglian Water set the ambitious target to reduce capital carbon emissions by 50% by 2015 from a 2010 baseline. Some initial responses to the challenge were 'how much will it cost', and 'we can't reduce both capital carbon and operational carbon'. These opinions and concerns have subsequently been proven wrong, with Anglian Water delivering a 58% reduction in capital carbon in 2018 from a 2010 baseline linked to a 23% reduction in cost and year-on-year reductions in operational carbon over the same period.

The setting of ambitious targets in line with recommendations within the Infrastructure Carbon Review (ICR) has been a key enabler, along with collaboration with the supply chain and innovation being the driver for low carbon solutions.

When Anglian Water set ambitious targets in 2010, we did not have all the answers to how our target would be achieved. However the board of directors and investors had belief that the target would be achieved, knowing 80% of the emissions were in concrete and steel with a strong and aligned supply chain ready to challenge these 'hot spots' of carbon. They also had the confidence not to accept solutions that did not meet the carbon and cost challenge.

We can now provide evidence as per the graph below of the causal link between reducing carbon and reducing cost in infrastructure projects

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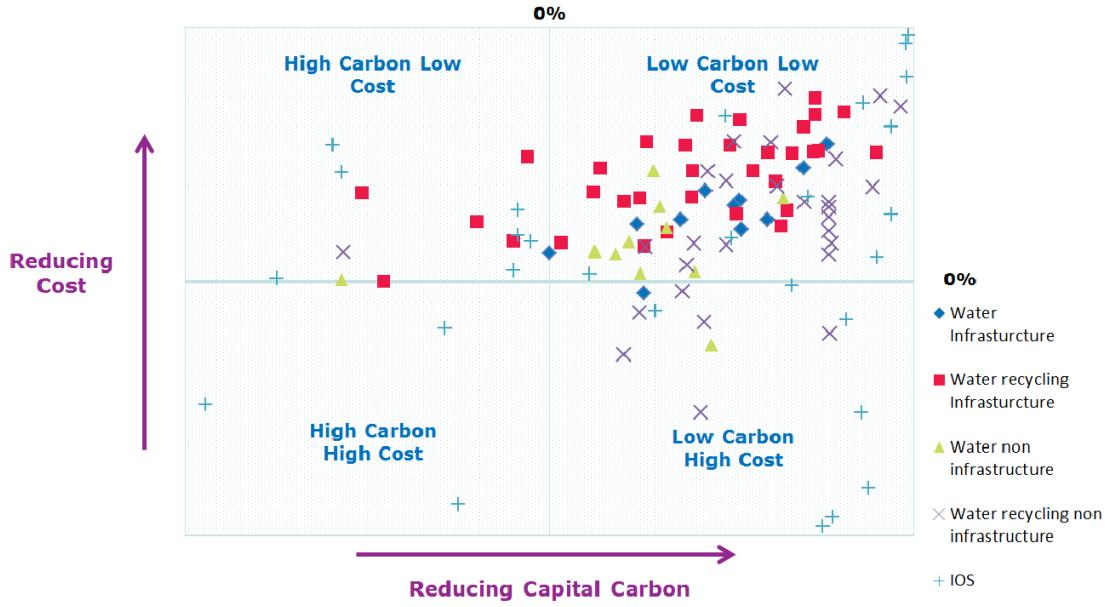

Question 12 (Avoided climate costs): What evidence is there of differences in climate impacts in the UK from holding the increase in global average temperature to well below 2°C or to 1.5°C?

ANSWER: There is a lack of evidence at present. The vast majority of impact modelling has been based on the Special Report on Emissions Scenarios (SRES) and not yet the Representative Concentration Pathways (RCPs) which would relate to specific temperature outcomes. Furthermore, there has been a focus on the SRES medium emissions scenario (particularly with regards to adaptation) which misses both the reality of higher emissions and the need to understand the potential for limiting emissions. Moreover, there needs to be a more nuanced approach to understanding climate change impacts through time, based on the potential for a period of more significant impacts (and legacy effects) before ambitious temperature limits are reached.

Part 5: Devolved Administrations

Question 13 (Devolved Administrations): What differences in circumstances between England, Wales, Scotland and Northern Ireland should be reflected in the Committee's advice on long-term targets for the Devolved Administrations?

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ANSWER: No Comment

Part 6: CCC Work Plan

Question 14 (Work plan): The areas of evidence the Committee intend to cover are included in the 'Background' section. Are there any other important aspects that should be covered in the Committee's work plan?

ANSWER: Anglian Water would like the evidence review to include and consider the role of the full range of actors such as stakeholders in decision making, including regulators. The production of evidence (e.g. UKCP18) and the specification of approaches to modelling, mitigation and adaptation are often set and determined by such actors, who therefore play a significant role in the approaches we take.