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:

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:

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: Traditionally, countries' carbon footprints have been reported on a 'territorial' emission basis, rather than on a 'consumption' basis. This reflects more on what each country has the ability to act on rather than the climate damage done by the activities of the people of that country. If the principle of the polluter pays were more closely followed the 'consumption' basis would be fairer.
In addition to a discussion about 'territorial' and 'consumption' emissions, it is also relevant to consider 'historic' emissions. Currently, with no scalable techniques to remove greenhouse gases from the atmosphere the issue is moot – it is not possible to address historic emissions. If, however, if it were possible to deploy greenhouse gas removal techniques at scale then it would raise the issue of whether historic emissions should also be addressed. The long-live nature of CO2 in the atmosphere implies that historic emissions are similarly damaging as current CO2 emissions. Demanding actions globally on a basis which only reflects current emissions, and not historic emissions, is likely to be seen as unfair by countries that have industrialised later. Unfortunately for the UK putting more emphasis on historic emissions is likely to significantly increase the UK's share of the overall 'clean-up cost'.

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: The cost of both emission reduction and greenhouse gas removal techniques are very likely to vary dependent on where the action occurs.
In terms of GGR, from a climate point of view it does not matter where in the world greenhouse gases are removed from the atmosphere – the atmosphere is well-mixed, so the removal of a tonne of CO2 from the air in the UK will have essentially the same climatic impact as the removal of a tonne of air in say Australia. This then implies that it would make sense to locate GGR techniques in locations where the overall cost is lowest (accounting for both financial and social aspects) and to trade between nations. To do so will require mechanisms to ensure that appropriate monitoring, reporting and verification standards are put in place. It will also require that negative emissions can be traded internationally and the mechanisms to support that.

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: The outsourcing of action on climate targets from the UK to other countries through a trading mechanism is necessary, essential and fraught with complexity. As noted in the previous answer, it is likely that the cost of climate action will vary by location and establishing mechanisms to allow for the undertaking of climate action in locations where it is cheapest to do so would be economically beneficial.
However, often the externalities – both positive and negative – of locating such actions in developing countries in other countries are inadequately assessed. The Sustainable Development Goals offer a useful framework to consider the impacts of actions in different parts of the world. Care must be taken that undertaking climate actions in one part of the world to offset harms in another part of the world does not come at the cost of SDG impacts in the countries where the actions take place. There is a risk of 'carbon dumping' analogous to the shipping of other wastes from developed to developing countries. At the same time, it should be recognised that, properly established, the establishment of industry in developing countries to reduce or remove emissions could be economically and developmentally beneficial to that country.

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:

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: It is very difficult to say. While GGR appear in climate models they have not been deployed at a material scale. While there have been projections and scenarios presented in many learned reports these are highly speculative in nature. Only by demonstrating such techniques at scale in the real world will the fine detail issues of impacts on other societal goals be established.

However, it is clear however that as long as there is no incentive mechanism in place to deploy GGR techniques, the potential for GGR is effectively zero.

If the goal is net zero and it is recognised that it is not possible to reduce all emissions to zero, it necessarily follows that GGR will be required. So it is illogical to set a net zero policy goal without also putting in place mechanisms to develop, demonstrate and deploy GGR techniques. It would be a bit like a government declaring that it would develop a cure for a newly-recognised disease (say the Zika virus) and then providing no resources to fund the development of a cure of providing no incentive for others to do so. It would be insincere in the extreme.

If appropriate incentives were in place then one could expect the development of a new waste-management industry – one to remove greenhouse gases from the atmosphere. However, the later any incentive mechanism is put in place the later such techniques can be scaled to a material extent.

Any answer here is highly speculative. However, with international trading and assuming that only a small proportion of countries seek to get to net zero by 2050 it may be possible for the UK to reach net zero by 2050. Globally, the 'balance of sources and sinks in the second half of the century' indicated in the Paris Agreement should be possible. Making technological predictions so far out is very speculative – noting that the impact of not putting in place an incentive mechanism to promote such technologies will have a deadening effect is not at all speculative.

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: With respect to GGR specifically, it is hard to see how technologies to develop technologies to remove emissions could hope to be developed in the absence of a 'tighter long-term emissions target for the UK, supported by targeted innovation policies' – that is precisely what is needed. As noted in the previous answer, it is naïve to expect such technologies to develop in the absence of incentives. There is a logical gap between the inclusion of GGR techniques in IAMs and the lack of incentives for their development and deployment.

There needs to be due attention paid to not just the 'supply' side of proposed GGR techniques – as described in numerous reports – but also the 'demand' side to motivate their development and deployment. In the absence of a demand side nothing material will happen in this field.

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:

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: The very act of setting a net zero (or tightened 2050 target) is an important step as it sends a signal to society and industry about the intended direction of travel. In addition government policy can deploy regulatory sticks and carrots in the form of penalties for emissions and incentives for cleaning up pollution.

For developing GGR techniques a mechanism similar to the Contract for Difference mechanism employed for renewable generation could be employed – with payment on a per tonne of CO2 removed rather than per kWh generated. Such a mechanism acts to stimulate development and enables the establishment of price-discovery mechanism. The steep reduction in off-shore wind power generation is testament to the efficacy of this policy instrument. Initially, prices would be set high to stimulate development, however, once such techniques have been developed a reverse auction system (or bid system) can rapidly drive the price down.

For deployment of GGR techniques a mechanism similar to the Producer Responsibility Obligation system for requiring producers of packaging to pay recyclers of that packaging for cleaning up their pollution is both fair and economically efficient. It penalises polluters and incentives those who clean up the pollution, while at the same time creating an incentive for increased innovation and efficiency.

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:

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:

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:

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: