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:

This should suffice for aspects of climate change and the need to keep below 1.5oC. After all, it's a survey of all reputable science on the matters. And it surveys the approaches of all countries towards the target – particular attention should be given to the UK's role in their projections exceeding the target in all scenarios. The UK's role is grossly inadequate.

Other evidence to support the inadequacy of the UK's role should be drawn from:

1. All government departments
   - Minimal or absent incentivisation of cleanness / disincentivisation of dirtiness in all regulated matters such as energy, transportation, housing
   - Minimal or absent enforcement of regulations
   - No sanctions related to the Climate Change Act
   - All government departments should be required to develop and implement policies that, in both their fiefdom and their zones of influence, achieves over 80% decarbonisation
2. BEIS, Ofgem
   - Totally inadequate incentivisation of the decarbonisation of all energy vectors
   - (For electricity, see the information already sent to the CCC by Mark Howitt of Storelectric, to Chris Stark)
   - Totally inadequate incentivisation of development of new clean technologies, especially large-scale long-duration storage
   - Business incentivisation is regardless of environmental performance
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3. DEFRA
   - It's hard to see any decarbonisation in their plans
4. DfT
   - Head-in-sands approach to decarbonising transportation in all categories
   - Blithe approach to de-carbonised transportation barely adding any power demand to the electricity grid
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5. MHCLG
   - Abandonment / watering down of green elements in the building codes
   - Housing and other developments are made proximate to large roads, not to railways; and even where railways pass in/near newer towns, new stations are not built in them (e.g. Middlewich, Cheshire)

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- ♦ Lack of support for urban metros above or below ground, other than in London

6. DWP
   - ♦ No support for people to move nearer to places of work (should be conditional on living within 2 miles)
7. Treasury, OBR, Audit Commission, MoD, CMA
   - ♦ Largely ignores environmental issues – money rules
8. Home Office, Foreign Office
   - ♦ Considers migration without considering the causes of migration. Even if 2oC is achieved, 1bn people will be flooded out of their homes / livelihoods, and 1bn more droughted / roasted out (by encroaching deserts); the food supply will become similarly constrained. Assume that only one quarter of these migrate to the EU – that's still 1.5 times the entire population of the EU. And our share is 1.5 times the population of the UK. It doesn't matter what border regulations and policies we have in place, we cannot keep out such numbers.
   - ♦ Climate change is completely overlooked as a major cause of global strife. It played a major role in Darfur, Syria, the rise of Boko Haram, the uprisings in Niger, Mali, Chad etc. and it makes all such problems (including Somalia) much more intractable. And we wonder why floods of people flee such wars? We should be stopping their causes, not trying to put a finger in the dyke to avoid responsibility for their results.

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:

Follow the IPCC's lead on this.

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:

Take all the measures we deem appropriate, within the UK.

Charge imputed carbon taxes (difference between the exporter's taxes and our own) on all

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imports to level the competition.

Refund carbon taxes (similarly to the above) on exports, again to level the competition.
ANSWER:

It is right to provide aid and assistance to poorer countries in reducing their carbon footprints. This should be a large part of the goal.

Take a leading role in international fora – which can only be done if we're making the effort ourselves as above.

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:

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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:

Carbon credits should be tradeable. But credits bought by a purchasing country should not count towards the selling country's total.

Emissions trading should be similar. Those who charge environmental taxes should be able to levy import charges equivalent to the differences between what the product / service actually paid and what it would have paid had they been done within the importing country; corresponding export credits should be allowable too.

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:

Agriculture can make enormous decarbonisation progress by promoting changes in diet. Further improvements would come from carbon taxes on inputs to farming. The biggest food-related emissions relate to transportation, and to wastage which is ~30% in the UK and more than that in many countries. We need some joined-up thinking here.

Industry is not hard to decarbonise if there is sufficient clean electricity and sufficient large-scale long-duration storage to support it.

Aviation and shipping are more difficult. Shipping can be helped by modern engines / fuels and by spinning sailshttps://www.theguardian.com/environment/2017/mar/14/spinning-sail-reboot-cut-fuel-make-ocean-tankers-greener and other such modifications.

Yes, some sectors must be allowed greater emissions – but only by trading emissions with other sectors, to ensure that other sectors decarbonise more correspondingly. For example, electricity can get to below 5% of 2010 emissions, and thereby provide credits for the other 15% based on world-wide 80% decarbonisation targets. This should provide:

1. Revenues to incentivise and finance the “excessive” decarbonisation of less-difficult sectors;
2. Price signals to incentivise (a) more efforts at decarbonisation and (b) lower utilisation in the more-difficult sectors.

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:

We should attempt to develop the technologies but, because the commercial operability / financeability of such technologies (e.g. carbon capture, use and storage in the electricity industry) is so uncertain, all sectors should be prevented from banking on their future contribution to meeting the targets: if such technologies come about, then they are bonuses that reduce overall costs, speed earlier achievement and help us exceed targets overall – which are all good outcomes.

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:

Yes they will. And they need to be backed with real money, not the few millions that the UK

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government likes to sprinkle here and there and which will never amount to enough to support the development of transformative technologies – only small-scale innovations with small impacts.

Such technologies include:

1. Large-scale long-duration electricity storage
2. Fuel cells, especially for large / long-range vehicles, shipping etc.
3. Other chemical processes that can synthesise required chemical products (e.g. plastics, hydrogen) with fewer / no process emissions (the energy costs would be taken care of by energy decarbonisation)
4. Waste recycling, including but not limited to:
    - General waste sorting, recycling and re-use
    - Plastics (especially low density)
    - Cleaning up the waste in oceans
    - Sewage / drainage, which takes so much urban waste into the oceans
    - Agricultural run-off
    - Lithium and other hard-to-recycle materials
    - "Mining" old dumps for their materials
    - Capturing methane emissions from waste dumps
5. Emissions-efficient aviation
6. More efficient tunnelling and pipe laying, including subterranean obstacle avoidance
    - To make metro / public transport systems cheaper, easier and less disruptive to build
    - To facilitate the construction of networks (e.g. heat, hydrogen) that will assist the transition
    - Include carriage of such spoil to enhance sea walls, extend land (e.g. Boris Island airport), raise low-lying land
7. Strains of crops that better resist global warming in all its diverse effects

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:

1. Diet: too much meat and dairy
2. Living closer to work, as people used to
3. Encouraging children to cycle / walk to school, including on their own
4. Encouraging adults to cycle / walk to shops and work
5. Domestic holidays
6. Insulating homes better
7. Switch off engines when stationary (equipment should be mandatory on new vehicles)

Note that 2-5 would also yield significant time benefits which would maximise free time.

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:

See my answers to question 1: looking at those issues will immediately suggest the policies. I copy and paste that answer here.

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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:

1. Pricing carbon properly, to include its second-order effects
2. Pricing carbon-equivalents appropriately, e.g. methane to reflect its higher severity but shorter duration than CO2
3. Pricing in indirect effects such as migration, food scarcity, pollution in agricultural run-offs, land loss / degradation to deserts and seas
4. Pricing private transport use

Note that all these tax increases should be offset with benefits / tax cuts so society as a whole (and especially the poor) don't lose out – except inasmuch as is required for an increase in funding for innovation, investment etc. to benefit the country's environmental and economic performance.

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:

Warmer winters.
More / stronger gales.
Drier summers.
A recent climate pattern whereby the sunniest months are April-June and Sept-Oct.

I note that many say that the earth has gone through hot periods from time to time in the past. What is overlooked is that each of those periods was associated with major extinction events: do we want to bring that on by man-made climate change?

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?

ANSWER:

They should be responsible for achieving the same or more within their regions, inasmuch as they have the responsibility.

Best to coordinate as much as possible between the UK government and devolved regions, while enabling the latter to pursue additional agendas and to try out variants / new policies.

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:

Essentially, all aspects covered by my other responses.

Much of what motivated the Brexit vote was a wish to control our borders in order to reduce immigration. If we don't achieve 1.5oC global warming, then a billion people will be displaced by coastal flooding and another billion by desertification. With two billion people on the move, if only a quarter of those go to the EU and we just take no more than a proportionate amount, that is still one and a half times our population. No amount of border control will keep them out. The only solution is to stop the causes of migration.

We already saw that in the huge migration flows of a few years ago. Although people tend to blame religious fanaticism for the implosion of Syria and almost every country in the Sahel Belt, in every case the rise in such fanaticism was preceded by a drying of their climate, degradation of their soil and increasing poverty, which created fertile soil for the sowers of hatred.

And this understates the problem: if this happens, then simultaneously the world will have lost all the productive land that supported these two billion people, so there will be global food shortages. Anywhere where there may be enough food will instantly become a magnet for migration, making these flows grow still further until we're as hungry as the rest of the world.

So it's imperitive that we work towards a 1.5oC world, or even less global warming than that, not just for their sakes but for our own as well.