Committee on Climate Change

Independent advice to government on building a low-carbon economy and preparing for climate change

The Sixth Carbon Budget and Welsh emissions targets – Call for Evidence

Background to the UK's sixth carbon budget

The UK Government and Parliament have adopted the Committee on Climate Change's (CCC) recommendation to target net-zero emissions of greenhouse gases (GHGs) in the UK by 2050 (i.e. at least a 100% reduction in emissions from 1990).

The Climate Change Act (2008, 'the Act') requires the Committee to provide advice to the Government about the appropriate level for each carbon budget (sequential five-year caps on GHGs) on the path to the long-term target. To date, in line with advice from the Committee, five carbon budgets have been legislated covering the period out to 2032.

The Committee must provide advice on the level of the sixth carbon budget (covering the period from 2033-37) before the end of 2020. The Committee intends to publish its advice early, in September 2020. This advice will set the path to net-zero GHG emissions for the UK, as the first time a carbon budget is set in law following that commitment.

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).

The Act also specifies other factors the Committee must consider in our advice on carbon budgets – the advice should be based on the path to the UK's long-term target objective, consistent with international commitments and take into account considerations such as social circumstances (including fuel poverty), competitiveness, energy security and the Government's fiscal position.

The CCC will advise based on these considerations and a thorough assessment of the relevant evidence. This Call for Evidence will contribute to that advice.

Background to the Welsh third carbon budget and interim targets

Under the Environment (Wales) Act 2016, there is a duty on Welsh Ministers to set a maximum total amount for net Welsh greenhouse gas emissions (Welsh carbon budgets). The first budgetary period is 2016-20, and the remaining budgetary periods are each succeeding period of five years, ending with 2046-50.

The Committee is due to provide advice to the Welsh Government on the level of the third Welsh carbon budget (covering 2026-30) in 2020, and to provide updated advice on the levels of the second carbon budget (2021-25) and the interim targets for 2030 and 2040. Section D of this Call for Evidence (covering questions on Scotland, Wales and Northern Ireland) includes a set of questions to inform the Committee's advice to the Welsh Government.

Question and answer 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 answers to <u>400 words</u> per question and provide supporting evidence (e.g. academic literature, market assessments, policy reports, etc.) along with your responses.

A. Climate science and international circumstances

Question 1: The climate science considered in the CCC's 2019 Net Zero report, based on the IPCC Special Report on Global Warming of 1.5°C, will form the basis of this advice. What additional evidence on climate science, aside from the most recent IPCC Special Reports on Land and the Oceans and Cryosphere, should the CCC consider in setting the level of the sixth carbon budget?

ANSWER: Not answered.

Question 2: How relevant are estimates of the remaining global cumulative CO_2 budgets (consistent with the Paris Agreement long-term temperature goal) for constraining UK cumulative emissions on the pathway to reaching net-zero GHGs by 2050?

ANSWER: Not answered.

Question 3: How should emerging updated international commitments to reduce emissions by 2030 impact on the level of the sixth carbon budget for the UK? Are there other actions the UK should be taking alongside setting the sixth carbon budget, and taking the actions necessary to meet it, to support the global effort to implement the Paris Agreement?

ANSWER: Not answered.

Question 4: What is the international signalling value of a revised and strengthened UK NDC (for the period around 2030) as part of a package of action which includes setting the level of the sixth carbon budget?

ANSWER: Not answered.

B. The path to the 2050 target

Question 5: How big a role can consumer, individual or household behaviour play in delivering emissions reductions? How can this be credibly assessed and incentivised?

ANSWER: Not answered.

Question 6: What are the most important uncertainties that policy needs to take into account in thinking about achieving Net Zero? How can government develop a strategy that helps to retain robustness to those uncertainties, for example low-regrets options and approaches that maintain optionality?

ANSWER: Not answered.

Question 7: The fourth and fifth carbon budgets (covering the periods of 2023-27 and 2028-32 respectively) have been set on the basis of the previous long-term target (at least 80% reduction in GHGs by 2050, relative to 1990 levels). Should the CCC revisit the level of these budgets in light of the net-zero target?

ANSWER: Not answered.

Question 8: What evidence do you have of the co-benefits of acting on climate change compatible with achieving Net Zero by 2050? What do these co-benefits mean for which emissions abatement should be prioritised and why?

ANSWER: Not answered.

C. Delivering carbon budgets

Question 9: Carbon targets are only credible if they are accompanied by policy action. We set out a range of delivery challenges/priorities for the 2050 net-zero target in our Net Zero advice. What else is important for the period out to 2030/2035?

ANSWER:

We recognise that public bodies in devolved administrations were highlighted in the Net Zero report as a group with an important role to play in reaching the 2050 targets. We would like to emphasise the need for policy that enables the public sector to drive change and demonstrate leadership in terms of action on climate change. Considering this we would flag the recent Scottish Government consultation on the role of Public Sector Bodies in tackling climate change. We would encourage the Committee to engage with Scottish Government to understand the key findings from this consultation. Crown Estate Scotland's response can be found here.

Question 10: How should the Committee take into account targets/ambitions of UK local areas, cities, etc. in its advice on the sixth carbon budget?

ANSWER:

Crown Estate Scotland have commissioned work on offshore renewables and Local Energy Systems. This work could be of interest to the Committee when considering how to take into account the opportunity local communities present in terms of reducing carbon emissions and leading the transition to low carbon energy. Our published study

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and ongoing work in this area have identified Shetland, Orkney and Islay as having particular opportunities for Local Energy Systems in conjunction with offshore renewables. We would encourage the Committee to engage with these leading communities to gather ideas on how best to take into account their ambitions and targets for reducing climate change emissions. Furthermore, the Committee could consider any emerging Local Place Plans (as part of local development plans), as introduced in the Planning (Scotland) Act 2019 to understand targets and ambitions of local areas as specified by local communities.

Question 11: Can impacts on competitiveness, the fiscal balance, fuel poverty and security of supply be managed regardless of the level of a budget, depending on how policy is designed and funded? What are the critical elements of policy design (including funding and delivery) which can help to manage these impacts?

ANSWER:

We would flag the importance of enabling measures such as studies, research, data provision, coordinating sector effort and targeted funding support when identifying critical elements of policy that can help manage impacts on competitiveness, the fiscal balance, fuel poverty and security of supply.

In our ongoing work on Local Energy Systems, we have identified a gap in support between innovation and commerciality. Support targeted at this gap would be useful move from innovation to the next stage on the pathway to commerciality. There may be a role for the enterprise agencies in this area or, in Scotland, the Scottish National Investment Bank.

Question 12: How can a just transition to Net Zero be delivered that fairly shares the costs and benefits between different income groups, industries and parts of the UK, and protects vulnerable workers and consumers?

ANSWER:

Crown Estate Scotland plays a key role in future development of CCUS as it manages leasing rights to carbon and gas storage on the seabed out to 200 nautical miles. As part of a study funded by Crown Estate Scotland, the Centre for Energy Policy at the University of Strathclyde recently published new research which represents a step towards understanding how CCUS could become an increasingly valuable part of Scotland's low carbon economy. The report highlights the potential of CCUS to help sustain jobs and build supply chain capabilities, helping the 'just transition' to a low carbon economy.

D. Scotland, Wales and Northern Ireland

Question 13: What specific circumstances need to be considered when recommending an emissions pathway or emissions reduction targets for Scotland, Wales and/or Northern Ireland, and how could these be reflected in our advice on the UK-wide sixth carbon budget?

ANSWER:

Crown Estate Scotland are committed supporting the delivery of a low carbon economy on the path to net zero. Key activities we are engaged in that should be considered when developing new emissions reductions targets are our Local Energy Systems work, ScotWind Leasing and our role in the Carbon Capture Utilisation and Storage sector.

Our draft Corporate Plan 2020 - 2023 outlines how Crown Estate Scotland intend to contribute to the growing body of work on the Blue Economy. We recognise the importance of an integrated approach to marine and coastal development in delivering inclusive economic growth and a low carbon economy. Offshore renewable energy, CCUS, ports and harbours feature in our new Corporate Plan as focus areas for activity in the coming years and we recognise the importance this could play in Scotland's ability to further reduce carbon emissions.

Question 14: The Environment (Wales) Act 2016 includes a requirement that its targets and carbon budgets are set with regard to:

- The most recent report under section 8 on the State of Natural Resources in relation to Wales;
- The most recent Future Trends report under section 11 of the Well-Being of Future Generations (Wales) Act 2015;
- The most recent report (if any) under section 23 of that Act (Future Generations report).

a) What evidence should the Committee draw on in assessing impacts on sustainable management of natural resources, as assessed in the state of natural resources report?

b) What evidence do you have of the impact of acting on climate change on well-being? What are the opportunities to improve people's well-being, or potential risks, associated with activities to reduce emissions in Wales?

c) What evidence regarding future trends as identified and analysed in the future trends report should the Committee draw on in assessing the impacts of the targets?

d) Question 12 asks how a just transition to Net Zero can be achieved across the UK. Do you have any evidence on how delivery mechanisms to help meet the UK and Welsh targets may affect workers and consumers in Wales, and how to ensure the costs and benefits of this transition are fairly distributed?

ANSWER: Not answered.

Question 15: Do you have any further evidence on the appropriate level of Wales' third carbon budget (2026-30) and interim targets for 2030 and 2040, on the path to a reduction of at least 95% by 2050?

ANSWER: Not answered.

Question 16: Do you have any evidence on the appropriate level of Scotland's interim emissions reduction targets in 2030 and 2040?

ANSWER:

Crown Estate Scotland would recommend the Committee reconsider the interim emissions reductions targets in light of Marine Scotland's Sectoral Marine Plan for Offshore Wind, the upcoming ScotWind Leasing cycle, Scottish Government's Draft Offshore Wind Policy Statement currently out for consultation and the commitments in the UK Offshore Wind Sector Deal. This suite of policy and progress in the offshore wind sector may enable the Committee to develop more ambitious interim targets for Scotland.

The Scottish Offshore Wind Energy Council (SOWEC) has been formed to develop a plan for offshore wind's contribution to achieving Scotland's climate change ambition of net-zero greenhouse gas emissions by 2045. Consultation with SOWEC could provide industry insight into the how recent/future progress in the offshore wind sector in Scotland could impact these interim emissions reduction targets.

Question 17: In what particular respects do devolved and UK decision making need to be coordinated? How can devolved and UK decision making be coordinated effectively to achieve the best outcomes for the UK as a whole?

ANSWER:

Given the key role that UK Government will play in the development of the CCUS industry in Scotland (i.e. through policy support and funding), it is vital Scottish Government and UK Government work closely and meaningfully collaborate. As detailed in our consultation response to Scottish Government's Draft Energy Strategy, we continue to encourage Scottish Government to demonstrate the benefits of CCUS to UK Government in terms of the opportunities it presents to reach net zero targets. These opportunities include delivering flexible, low carbon power generation, decarbonising industry and attracting industry to such 'low-carbon' zones.

E. Sector-specific questions

Question 18 (Surface transport): As laid out in Chapter 5 of the Net Zero Technical Report (see page 149), the CCC's Further Ambition scenario for transport assumed 10% of car miles could be shifted to walking, cycling and public transport by 2050 (corresponding to over 30% of trips in total):

a) What percentage of trips nationwide could be avoided (e.g. through car sharing, working from home etc.) or shifted to walking, cycling (including e-bikes) and public transport by 2030/35 and by 2050? What proportion of total UK car mileage does this correspond to?

b) What policies, measures or investment could incentivise this transition?

ANSWER: Not answered.

Question 19 (Surface transport): What could the potential impact of autonomous vehicles be on transport demand?

ANSWER: Not answered.

Question 20 (Surface transport): The CCC recommended in our Net Zero advice that the phase out of conventional car sales should occur by 2035 at the latest. What are the barriers to phasing out sales of conventional vehicles by 2030? How could these be addressed? Are the supply chains well placed to scale up? What might be the adverse consequences of a phase-out of conventional vehicles by 2030 and how could these be mitigated?

ANSWER: Not answered.

Question 21 (Surface transport): In our Net Zero advice, the CCC identified three potential options to switch to zero emission HGVs – hydrogen, electrification with very fast chargers and electrification with overhead wires on motorways. What evidence and steps would be required to enable an operator to switch their fleets to one of these options? How could this transition be facilitated?

ANSWER: Not answered.

Question 22 (Industry): What policy mechanisms should be implemented to support decarbonisation of the sectors below? Please provide evidence to support this over alternative mechanisms.

a) Manufacturing sectors at risk of carbon leakage

b) Manufacturing sectors not at risk of carbon leakage

c) Fossil fuel production sectors

d) Off-road mobile machinery

ANSWER: Not answered.

Question 23 (Industry): What would you highlight as international examples of good policy/practice on decarbonisation of manufacturing and fossil fuel supply emissions? Is there evidence to suggest that these policies or practices created economic opportunities (e.g. increased market shares, job creation) for the manufacturing and fossil fuel supply sectors?

ANSWER: Not answered.

Question 24 (Industry): How can the UK achieve a just transition in the fossil fuel supply sectors?

ANSWER: Not answered.

Question 25 (Industry): In our Net Zero advice, the CCC identified a range of resource efficiency measures that can reduce emissions (see Chapter 4 of the Net Zero Technical Report, page 115), but found little evidence relating to the costs/savings of these measures. What evidence is there on the costs/savings of these and other resource efficiency measures (ideally on a £/tCO2e basis)?

ANSWER: Not answered.

Question 26 (Buildings): For the majority of the housing stock in the CCC's Net Zero Further Ambition scenario, 2050 is assumed to be a realistic timeframe for full roll-out of energy efficiency and low-carbon heating.

a) What evidence can you point to about the potential for decarbonising heat in buildings more quickly?

b) What evidence do you have about the role behaviour change could play in driving forward more extensive decarbonisation of the building stock more quickly? What are the costs/levels of abatement that might be associated with a behaviour-led transition?

ANSWER: Not answered.

Question 27 (Buildings): Do we currently have the right skills in place to enable widespread retrofit and build of low-carbon buildings? If not, where are skills lacking and what are the gaps in the current training framework? To what extent are existing skill sets readily transferable to low-carbon skills requirements?

ANSWER:

Crown Estate Scotland have a responsibility to ensure rural assets under our management create financial value and wider public benefits. On the rural estates, significant ongoing capital investment, particularly on farm buildings and residential properties, is required to meet our statutory obligations and to ensure we are a good landlord. In considering the skills required to enable widespread retrofit of low-carbon buildings, we would encourage

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the Committee to acknowledge the diverse skill sets required; in particular for farm buildings and residential properties where specialist skills would often be required.

Question 28 (Buildings): How can local/regional and national decision making be coordinated effectively to achieve the best outcomes for the UK as a whole? Can you point to any case studies which illustrate successful local or regional governance models for decision making in heat decarbonisation?

ANSWER: Not answered.

Question 29 (Power): Think of a possible future power system without Government backed Contracts-for-Difference. What business models and/or policy instruments could be used to continue to decarbonise UK power emissions to close to zero by 2050, whilst minimising costs?

ANSWER:

Crown Estate Scotland are growing our coastal and marine activity to help enable the transition to a net zero emissions economy. To ensure activities align with and deliver on necessary emission reductions, we need clear, strong, and specific actions and/or policies, particularly in terms of the deployment of offshore wind and marine renewables. Through current consultations on the Offshore Wind Sectoral Marine Plan and the Offshore Wind Policy Statement, Scottish Government are beginning to provide clear direction for the offshore renewable deployment needed to achieve net zero ambitions. We encourage these policy developments to generate clear and specific targets to support future offshore wind planning as the Sectoral Marine Plan continues to support the industry ambitions beyond its current iteration.

Question 30 (Power): In Chapter 2 of the Net Zero Technical Report we presented an illustrative power scenario for 2050 (see pages 40-41 in particular):

a) Which low-carbon technologies could play a greater/lesser role in the 2050 generation mix? What about in a generation mix in 2030/35?

b) Power from weather-dependent renewables is highly variable on both daily and seasonal scales. Modelling by Imperial College which informed the illustrative 2050 scenario suggested an important role for interconnection, battery storage and flexible demand in a future low-carbon power system:

   i. What other technologies could play a role here?

   ii. What evidence do you have for how much demand side flexibility might be realised?

ANSWER:

In a Scottish context, local energy systems involving offshore generation and energy storage could play an important role in the energy mix. Our already published and ongoing work on energy systems has identified potential opportunities with industry (distilleries, fish farms, oil and gas offshore rigs and local ports) that are closely tied to local circumstances and characteristics and offer contributions to industrial decarbonisation. The Committee should engage with Scottish Government on their recently concluded consultation on Local Energy Policy Statement.

In saying this, it is important to appreciate that commercial viability is challenging for some technologies involved in these systems. From our experience in the offshore renewables sector we appreciate the importance of financial support from demonstration through to innovation and then into commercial viability. It would therefore be useful, as part of any reconsideration of policy or support mechanisms, to examine what targeted investment mechanisms might provide most suitable support to offshore renewables as part of local energy systems.

Question 31 (Hydrogen): The Committee has recommended the Government support the delivery of at least one large-scale low-carbon hydrogen production facility in the 2020s. Beyond this initial facility, what mechanisms can be used to efficiently incentivise the production and use of low-carbon hydrogen? What are the most likely early applications for hydrogen?

ANSWER:

In our response to the Infrastructure Commission for Scotland's Initial Call for Evidence we encouraged the Commission to consider the potential that hydrogen presents in terms of decarbonisation. Projects such as H21 and H100 illustrate the opportunity that hydrogen brings in terms of reaching carbon reduction targets/setting ambitious interim targets. To encourage progress in the sector we encouraged interested parties (including governments/public bodies) to map out the infrastructure required to facilitate a transition to hydrogen as part of the effort to decarbonise energy infrastructure in Scotland. Understanding what existing infrastructure can be utilised and what development is required could encourage the market development required in the sector.

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Question 32 (Aviation and Shipping): In September 2019 the Committee published advice to Government on international aviation and shipping and Net Zero. The Committee recognises that the primary policy approach for reducing emissions in these sectors should be set at the international level (e.g. through the International Civil Aviation Organisation and International Maritime Organisation). However, there is still a role for supplementary domestic policies to complement the international approach, provided these do not lead to concerns about competitiveness or carbon leakage. What are the domestic measures the UK could take to reduce aviation and shipping emissions over the period to 2030/35 and longer-term to 2050, which would not create significant competitiveness or carbon leakage risks? How much could these reduce emissions?

ANSWER:

In our draft Corporate Plan that was recently consulted on, we have outlined our proposed investment strategy for 2020 – 2023. In this we detail our intention to invest in Scotland's blue economy, given its close association to the Scottish Crown Estate coastal assets. Ports and harbours are outlined as a potential investment focus area and our current thinking can be broken into four distinct sub-sectors for investment, these include: port infrastructure that supports the offshore wind sector, deep water facilities for cruise liners/other facilities, infrastructure supporting boat-based tourism and development land associated with ports ad harbours. We would welcome supplementary domestic policies supporting the blue economy, to ensure our activities promote competitiveness, achieve sustainable economic development through trade and transport links and support the overall reduction of emissions in Scotland.

Question 33 (Agriculture and Land use): In Chapter 7 of the Net Zero Technical Report we presented our Further Ambition scenario for agriculture and land use (see page 199). The scenario requires measures to release land currently used for food production for other uses, whilst maintaining current per-capita food production. This is achieved through:

- A 20% reduction in consumption of red meat and dairy
- A 20% reduction in food waste by 2025
- Moving 10% of horticulture indoors
- An increase in agriculture productivity:
  - Crop yields rising from the current average of 8 tonnes/hectare for wheat (and equivalent rates for other crops) to 10 tonnes/hectare
  - Livestock stocking density increasing from just over 1 livestock unit (LU)/hectare to 1.5 LU/hectare

Can this increase in productivity be delivered in a sustainable manner?

Do you agree that these are the right measures and with the broad level of ambition indicated? Are there additional measures you would suggest?

ANSWER:

As part of our proposed strategic objective to enable the sustainable use of natural resources (see draft Corporate Plan) we will support initiatives that help farmers transition to financially viable business models and pilot new ways of producing food. We are keen to work with partners and promote findings of this work publicly to ensure outputs can be considered in future scenario mapping related to agriculture and land-use in Scotland.

Question 34 (Agriculture and Land use): Land spared through the measures set out in question 33 is used in our Further Ambition scenario for: afforestation (30,000 hectares/year), bioenergy crops (23,000 hectares/year), agro-forestry and hedgerows (~10% of agricultural land) and peatland restoration (50% of upland peat, 25% lowland peat). We also assume the take-up of low-carbon farming practices for soils and livestock. Do you agree that these are the key measures and with the broad level of ambition of each? Are there additional measures you would suggest?

ANSWER:

Crown Estate Scotland have been involved in leading trials of the Natural Capital Protocol for land-based businesses. The application of the Protocol on land-based businesses (farms, estate-wide) encouraged land managers to consider natural capital enhancing and low-carbon alternatives in decision making. The outputs of the trial of being taken forward by Crown Estate Scotland and being fed into various working groups including the Scottish Forum on Natural Capital Sustainable Land Management Working Group. The ambition is to work with partners to promote the approach throughout Scotland, so land-based businesses have a streamlined and standardised way to articulate the

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farm/estate's wider benefits (enabling businesses to provide evidence for securing future public payments/revenue streams).

Question 35 (Greenhouse gas removals): What relevant evidence exists regarding constraints on the rate at which the deployment of engineered GHG removals in the UK (such as bioenergy with carbon capture and storage or direct air capture) could scale-up by 2035?

ANSWER: Not answered.

Question 36 (Greenhouse gas removals): Is there evidence regarding near-term expected learning curves for the cost of engineered GHG removal through technologies such as bioenergy with carbon capture and storage or direct air capture of CO_2?

ANSWER: Not answered.

Question 37 (Infrastructure): What will be the key factors that will determine whether decarbonisation of heat in a particular area will require investment in the electricity distribution network, the gas distribution network or a heat network?

ANSWER: Not answered.

Question 38 (Infrastructure): What scale of carbon capture and storage development is needed and what does that mean for development of CO_2 transport and storage infrastructure over the period to 2030?

ANSWER: See answer to Q.12.