

The Fifth Carbon Budget - Call for Evidence

www.theccc.org.uk/call-for-evidence

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.

Questions for consideration:

A. Climate Science and International Circumstances

Climate science and international circumstances are important criteria in setting carbon budgets.

- The science indicates the impacts associated with different levels of climate change and the limit on emissions globally if these risks are to be contained.
- International circumstances inform the prospects of future action to reduce emissions globally, potential requirements of the UK to contribute to those actions, and prospects for low-carbon technology development and carbon pricing.
- The EU places obligations on Member States to reduce emissions to contribute to reductions in the bloc as a whole. These imply a minimum level of effort for the UK's carbon budgets.

The Committee intends to draw primarily on the work of the IPCC, as published in the Fifth Assessment Report, in assessing the implications of climate science for the budget advice

The Committee's advice is based on a climate objective to limit central estimates of temperature rise to as close to 2°C as possible, with a very low chance of exceeding 4°C by 2100 (henceforth referred to as "the climate objective"). This is broadly similar to the UNFCCC climate objective, and that of the EU.

In order to achieve this objective, global emissions would have to peak around 2020, before decreasing to roughly half of recent levels by 2050 and falling further thereafter.

The UNFCCC is working toward a global deal consistent with such reductions. Individual parties are submitting pledges for effort beyond 2020, with the details of the agreement to be discussed in Paris late in 2015.

The EU has agreed a package that requires a reduction in emissions of at least 40% on 1990 levels by 2030, on the way to an 80-95% reduction by 2050. The UK Government supported this package, while arguing for an increase to 50% in the context of a global deal.

The US and China have jointly made pledges for the period beyond 2020. The US has pledged a reduction of 26-28% by 2025 versus 2005, requiring a doubling of the rate of carbon reduction compared to 2005-2020 and on a trajectory to economy-wide cuts of the order of 80% by 2050. China has pledged to peak CO₂ emissions around 2030, and to make best efforts to do so earlier.

Question 1 *The IPCC's Fifth Assessment Report will form the basis 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?*

EEF is content that the IPCC's Fifth Assessment Report forms the basis of the CCC's assessment of climate risks, emissions reduction pathways, and climate goals and has no further suggestions for evidence that should be considered in this regard.

Question 2 *To what extent are the UN talks in Paris likely to have implications for the Committee's advice beyond the pledges and positions announced in advance of the talks?*

There is a chance that further pledges will be made on top of the EU's 2030 commitment by a selection of EU member states, or that the EU will promise collectively to go beyond its 40% commitment by purchasing emissions credits. It's also possible joint initiatives on particular technologies could be launched at the talks that would alter where and how investment within the UK needs to be made.

We would urge negotiators to take a cautious approach on this front. The UK's fourth carbon budget means this country is already aiming to cut emissions by more than most of its EU competitors, let alone overseas competitors. The merits of any additional 2030 commitments need to be weighed carefully to ensure they do not further disadvantage energy-intensive industries trying to compete globally, and evidence provided that they fit within the most cost-effective pathway for UK emissions reductions. Purchasing credits would seem to be a cost-efficient approach but they must come from non-competing sectors and deliver additional health and environmental benefits.

The CCC should delay its advice until after the conclusion of the Paris talks so it can take their outcome into account. If this is impossible, we would ask the CCC to consult closely with DECC, the European Commission and Luxembourg Presidency of the EU to make a qualified guess as to the most likely scenarios at the talks and then make recommendations tailored to each of those.

It is also vitally important that a deal in Paris this year is not seen as a reason to stop protecting industries at risk of carbon leakage due to existing and impending EU and UK policy. The EU ETS for example will continue to affect competitiveness until UK plants in at-risk sectors face the same emissions targets and decarbonisation costs as all their overseas competitors.

Question 3 *Based on the available evidence, does the EU 2030 package reflect the*

best path to its stated 2050 ambition? How might this package change, specifically its targeted

EEF welcomes the increased flexibility in the 2030 package, which should help member states meet the overarching emissions target at lower cost and believes that target is set at an appropriate level. But the package's eventual cost effectiveness will depend on how the common energy efficiency and renewables goals are implemented and the outcome of effort-sharing negotiations. It will also be very much dependent on what amendments are agreed to carbon leakage provisions for the next phase of the ETS, especially as the impacts of the Market Stability Reserve and its early introduction begin to be felt. The existing provisions are already inadequate for some sectors such as steel, and will become increasingly so as we approach 2020.

European steel association Eurofer has calculated that under the existing leakage provisions, direct and indirect ETS costs could add around £20 to average production costs for a tonne of steel during the next phase of the ETS. This would have a significant impact on a sector in which contracts can be won or lost on as little as £5/tonne and many plants have overseas owners that may stop investing if they see additional costs approaching.

The ETS as a whole does not seem to work well for industries like this that also have limited short-term options for decarbonisation. Hitting them with repeated ETS costs simply depletes the capital available for investment once long-term options like CCS become commercially available. For this reason, we are still calling for a substantial review and reform of the scheme, and for as much support with decarbonisation as possible.

We also have concerns about the impact on UK companies of the package's promise to give some member states ETS allowances to help with their effort-sharing targets, and resent yet another interference in what is supposed to be a market mechanism.

The CCC must also ensure the UK does not go beyond what is agreed at EU level to keep us within reach competitively of our main EU rivals.

As discussed above, any changes to UK and EU targets in the wake of Paris must be captured within the CCC's advice, and achieved as cost effectively as possible, and certainly mustn't impact unfairly on energy intensive sectors fully exposed to global market forces.

Question 4 How does the UK's legislated 2050 target affect its ability to support international efforts to reduce emissions, including its position in negotiations? Does the level of UK carbon budgets have any additional impact (over-and-above the 2050 target) for the UK in international discussions?

The UK's 2050 target and carbon budgets may have helped persuade a small group of countries to adopt similar mechanisms and goals but this has been the result of bilateral climate diplomacy. The same impact is not apparent in formal international negotiations where the EU negotiates with a single voice.

Having a pre-agreed legal commitment is also a disadvantage in this kind of negotiation. There is little evidence that leading by example is an effective strategy in multilateral climate talks.

The UK should focus on developing a climate change policy that shows it is possible to reduce emissions while also having a growing economy and ensuring a level-playing field for domestic manufacturers.

B. The cost-effective path to the 2050 target

The carbon budgets need to set a path that is achievable from today without being over-optimistic about what is achievable in later periods to prepare for the 2050 target.

The Committee has previously set out scenarios for 2030 that balance effort before 2030 with potential opportunities from 2030 to 2050. The scenarios aim to include ways of reducing emissions that are likely to be relatively low cost and actions that will develop options that may need to be deployed at scale by 2050.

These scenarios, reviewed in detail in the Committee's report *The Fourth Carbon Budget Review – the cost-effective path to the 2050 target*, include substantial investment in low-carbon power generation, roll-out of low-carbon heat (heat pumps and district heating), development of the markets for ultra-low emissions vehicles and a combination of energy efficiency measures and fuel switching in industrial sectors.

The scenarios also reflect detailed assessments of what is practically deliverable, and the Committee monitors progress towards them as part of its statutory duties. The *2014 Progress Report to Parliament* indicated that current policy would not be enough to meet the fourth carbon budget, but that the 'policy gap' could be closed at affordable cost.

The set of policy options required to close the gap include:

- Strengthening the EU Emissions Trading System.
- Setting a clear objective for Electricity Market Reform (EMR) beyond 2020.
- Focusing on low-cost residential energy efficiency.
- Simplifying policies targeting commercial energy efficiency.
- Tackling financial and non-financial barriers to low-carbon heat.

- Pushing for strong EU targets for new vehicle efficiency in 2030.

The Government has subsequently published various documents, including its formal response, as required under the Climate Change Act, and the National Infrastructure Plan. The Plan includes investments of around £100 billion in low-carbon power generation in the 2020s, in line with the scenarios from the EMR Delivery Plan that reach 100 gCO₂/kWh by 2030. It also has significant investments in offshore oil and gas and in the road network. This includes £15 billion of new spending on roads and around £50 billion on offshore oil and gas.

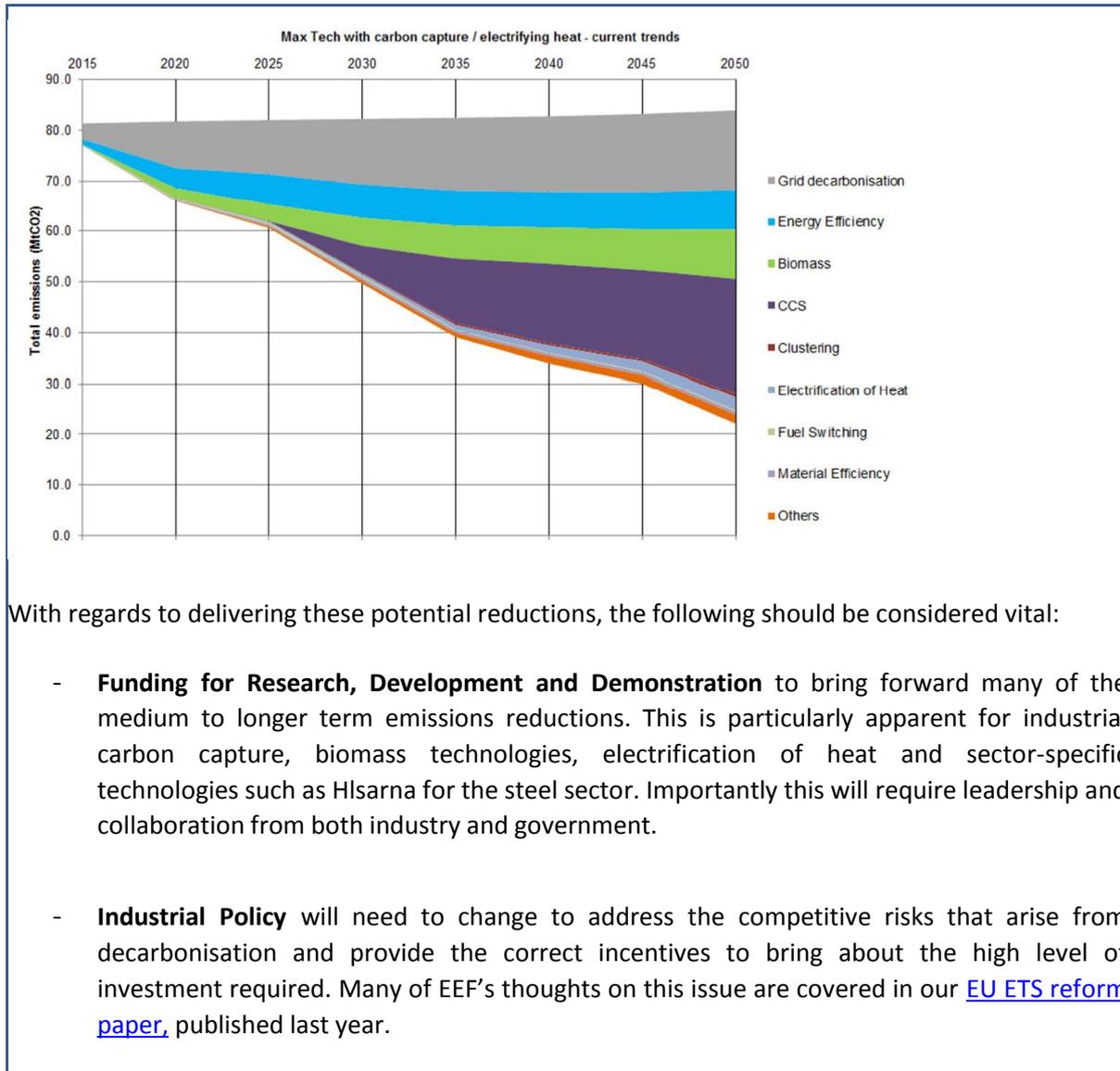
Question 5 *In the area(s) of your expertise, what are the opportunities and challenges in reducing emissions to 2032, and at what cost? What may be required by 2032 to prepare for the 2050 target, recognising that this may require that emissions in some areas are reduced close to zero?*

The Committee will already be intimately aware of the significant challenges faced by energy intensive industry in decarbonising through to 2050. The recently published 2050 [Industrial Decarbonisation and Energy Efficiency Roadmaps](#) provide us with the most comprehensive analysis of this to date, looking at the emissions reduction potential as well as the costs, barriers and enablers, of the eight most heat intensive sectors in the UK: steel, chemicals, cement, paper, glass, refineries, ceramics, and food & drink. Together, these sectors represent two-thirds of UK industrial emissions.

The roadmap project has produced reports for each of the industries, as well as detailed appendices, but taking the energy intensive sector as a whole, it was estimated that the ‘max technical’ emissions reduction potential by 2050 was 73% from 81 to 22 MT CO₂. Achieving this could require around £16bn in capital investment, although there is considerable uncertainty surrounding this. It is estimated that a 45% reduction could be achieved by 2032.

It is important to note that this ‘max potential’, whilst broadly fitting with the high-level aim of the plan to reduce industrial emissions by 70% by 2050, is purely technical in scope, it assumes that the requisite technology will be available, does not consider practical barriers such as unsuitable local geology for CCS, and most importantly does not take into account affordability.

As the graph below demonstrates, a huge amount of the emissions reductions potential comes from areas outside industry control (grid decarbonisation), areas that currently lack an adequate policy framework (i.e. biomass) or areas where the technology is not yet even proven and available (i.e. industrial CCS).



Question 6 *What, if any, is the role of consumer, individual or household behaviour in delivering emissions reductions between now and 2032? And, separately, after 2032*

EEF agrees with the principle of individuals being asked to drive emissions reductions wherever possible through the goods they purchase.

There are significant emissions savings to be made through consumers choosing more energy efficient appliances and modes of transport. The lighting industry for example believes the proportion of UK electricity consumed by lighting could be cut from 16% to 4% through the full roll out of LEDs. Correctly applied policies in this area do not discriminate between different market actors and save the consumer money.

More generally, as the ultimate drivers of the production of manufactured goods, if consumers can be persuaded to value goods with a lower carbon footprint over those with higher ones, it will help build the business case for investments in industrial decarbonisation. The potential for this and the current barriers to it are explored in the 2050 Roadmaps under the heading of 'Value Chain Collaboration'.

Significant thought has already been given to the 'pass through' problem for globally made and traded products; i.e. the fact that because only a small proportion of manufacturers globally are subject to carbon costs, no manufacturer, by and large, is able to pass them through to its customers. In the absence of a genuine robust global climate change deal, various solutions such as border adjustment taxes have been suggested – some of the possibilities relating to the steel sector have been explored in a 2014 [report by Climate Strategies](#). In general, it has been concluded that such solutions would be extremely complex to implement and could be subject to challenge from the WTO.

Question 7 *Is there evidence to suggest that actions to further reduce emissions after 2032 are likely to be more or less challenging to achieve than actions in the period up to 2032?*

The answer to this question will naturally vary from sector to sector and the overall picture for the economy is likely to be mixed.

For example, the renewables sector has shown progress in reducing costs and looks set to continue to do so; it is likely that any emissions reduction potential left available from further deployment of renewables (particularly onshore wind and solar) could be easier to achieve and more cost effective in the 2030s than currently is the case.

Conversely, if we consider the power sector as a whole, much of the further emissions reduction expected beyond 2020 could well come from the roll out of CCS – [National Grid's Future Energy Scenarios](#) foresee an almost five-fold increase in CCS capacity from 2030 (2.2GW) to 2035 (11 GW), representing a third of the total new generation capacity built during this period. Whilst it is possible

that CCS costs could start to be reduced during the 2020s ([CCC estimates](#) costs reductions from £180/MWh to £100/MWh during 2020s), it is still reasonable to assume that the costs of a large scale roll out of CCS, including the provision of requisite infrastructure, could prove far more expensive than measures, such as onshore wind, that are largely rolled out in advance of 2030.

Similarly, when it comes to industrial decarbonisation, whilst costs for many technologies are likely to come down during the 2020s, the so-called low-hanging fruit in terms of energy efficiency is likely to have largely been plucked by the time of the fifth carbon budget. If we return our attention to the cross-sector summary of the [2050 Industrial Roadmaps](#), we can see that the contribution of grid decarbonisation and energy efficiency (i.e. the relatively easier options for industry) largely level off after 2035, around half-way through the sixth carbon budget. Following this, the bulk of emissions reduction will come from CCS, biomass and electrification of heat, with CCS taking the lion's share. All of these options, if commercially available and viable by this date, will be considerably more expensive and disruptive than options taken in the 2020s.

Experience of Climate Change Agreements (CCAs) has shown that, as they progress, energy efficiency improvements become harder to find and more difficult to finance. This is reflected in, almost universally, lower sector targets in the [second phase of CCAs](#) compared to the [first](#).

Question 8 Are there alternatives for closing the 'policy gap' to the fourth carbon budget that could be more effective? What evidence supports that?

To touch on the policy recommendations made by the Committee in its 2014 Progress Report to Parliament:

- *Use of the 2050 decarbonisation roadmaps to establish a strategy for delivering abatement*

EEF is supportive of this recommendation and has [called for such a strategy itself](#). However, if this is to be genuinely productive it must be ambitious and generate concrete policy proposals to tackle the barriers to large-scale emissions reduction. Such a strategy would need to recognise that current policy mechanisms for decarbonising energy-intensive industries are inadequate. The EU ETS is ill suited to stimulating research, development and deployment in the many sectors where there are currently no cost-effective technologies available to deliver the reductions called for. In this situation the cost of carbon merely acts as a tax, draining cash from industry. A meaningful strategy would therefore need to address both the issues of competitive distortions created by climate change policy and the issue of 'missing money'. For further information please see [our EU ETS reform paper](#).

It should also be noted that the roadmaps by no means cover the entirety of industrial sectors in the UK, it is vital that the remaining industries are considered as the strategy is developed.

- *Set an approach to deploying initial industrial CCS projects*

Again EEF is highly supportive of this recommendation but would point out that:

- Such an approach would need a funding mechanism, or mechanisms, similar to those seen under EMR. The Committee should pay close attention to the findings of the [Tees Valley Unlimited industrial CCS project](#), due in July 2015.
- Whilst the CCC has recommended large-scale deployment during the late 2020s, the Roadmaps indicate that this is unlikely to happen until the 2030s and 2040s.
- *Review policies for compensating at-risk-industries for costs of low carbon policies by 2016*

Given that that the full compensation package will not be implemented until April 2016, a review at this stage may not be of significant value. The more urgent task will be developing a post-2019/20 package that provides a long-term sustainable solution to this issue.

- *Strengthening the EU Emissions Trading System*

Finally it is worth noting that the EU ETS is already being tightened through the higher post-2020 linear reduction factor and as a result of the MSR. We are concerned about the effect these changes could have on energy-intensive sectors that compete globally if not accompanied by stronger carbon leakage provisions. They should also be allowed time to bed in before strengthening the scheme is considered again.

Question 9 Are the investments envisaged in the National Infrastructure Plan consistent with meeting legislated carbon budgets and following the cost-effective path to the 2050 target? Would they have wider implications for global emissions and the UK's position in international climate negotiations?

EEF does not have the evidence or expertise to comment specifically on this question but would say that where infrastructure projects have been identified as being of strategic importance, carbon budgets should seek to work within that context. The CCC must therefore consider their impact on emissions and provide advice on possible mitigation and balancing actions.

C. Budgets and action

The UK's statutory 2050 target requires actions across the economy to reduce emissions. Many of these actions will be driven by (UK and devolved) Government policy and implemented by businesses and consumers. There will be an important role for Local Authorities in successful delivery.

Although the carbon budgets do not require specific actions, they provide an important indication of the overall direction that policy will take in future. Once set, carbon budgets can only be changed if there has been a significant change in the relevant circumstances set out in the Climate Change Act.

Feedback from businesses as part of the Committee's 2013 Call for Evidence for the review of the fourth carbon budget was that stability is an important and valuable characteristic of carbon budgets.

Question 10 *As a business, as a Local Authority, or as a consumer, how do carbon budgets affect your planning and decision-making?*

Discussions with EEF members indicate that carbon budgets are not often considered. Where they are at all, they are seen as too opaque and distant to have a direct impact on investment decisions. However, the policy and legislation that may emanate from them undoubtedly has an impact. For example, one can argue that the drive towards domestic energy efficiency, with renewed commitments from all political parties, are a direct result of carbon budgets. For UK manufacturers supplying this market, this will undoubtedly improve investment conditions.

Similarly, carbon budgets could well result in an electricity decarbonisation target for 2030 being set during the course of the next parliament. This could have a profound impact on energy price projections during the 2020s (depending on the target), which in turn could influence investment decisions for energy-intensive manufacturers. Conversely, an electricity sector decarbonisation target is more than likely to be seen positively by manufacturers looking to supply the low-carbon electricity sector in the UK.

Undoubtedly there is a careful balancing act to be played and both the Committee and Government should pay close attention to any competitive issues that may arise from the implementation of carbon budgets.

Question 11 *What challenges and opportunities do carbon budgets bring, including in relation to your ability to compete internationally? What evidence do you have for this from your experience of carbon budgets to date?*

EEF's analysis indicates that if the fifth budget continues along the same trajectory as the fourth, emissions reductions in the non-traded sector would need to fall to 50-60% below 2005 levels, given traded sector targets are not affected by carbon budgets. The EU's Effort Sharing Decision would only require a 40% cut in the non-traded sector by 2030. This immediately suggests that there might be some competitive disadvantage for UK firms.

For the manufacturing sector, a 50-60% cut in non-traded emissions would mean a greater push for efficient heat use, the competitive impacts of which will depend on the drivers the government chooses. If it relies principally on price signals – or gas taxes – as it has before, the impacts would be most keenly felt in gas-intensive sectors. The disparity in gas prices between the EU and the US has already disadvantaged some EU manufacturing sectors such as chemicals. A further widening of this gap could cause serious damage. For further information see [EEF's report on Shale Gas](#) and PWC's report on unconventional gas's impact on [US manufacturing](#).

The key message here is that the UK should seek to align its climate change ambition and action with that of the EU. This is the best means we have at present of minimising any intra-EU competitive distortions.

However, even if carbon budgets and EU commitments align, it is possible the budgets would still drive additional action affecting competitiveness through the CCC's advice and recommendations. The most obvious example of this already happening has been the introduction of the carbon price floor in the traded sector. It is widely accepted that this has done little, if anything, to increase investment in low-carbon generation but has increased electricity prices – at £18/tCO₂ it will raise prices by around £9/MWh this year. Government has introduced a compensation scheme to mitigate this impact on energy intensive industry, but there are still many sectors unable to access this compensation due to state aid guidelines. For further information on this see [EEF's Energy Policy for Manufacturers](#).

For this reason, we would ask the CCC to weigh the competitive impacts of its policy advice and recommendations carefully, especially the impact on companies trying to compete at EU and international levels. The UK also needs to ensure the EU protects competitiveness internationally, for example through its carbon leakage provisions.

Question 12 *What would you consider to be important characteristics of an effective carbon budget? What is the evidence for their importance?*

The most important element of an effective carbon budget are:

- **A realistic and up-to-date understanding of the likely emissions reductions potential of each sector and its cost effectiveness.** For example, whilst the fourth carbon budget and early thinking for the fifth have assumed significant amounts of industrial CCS will be

deployed during the 2020s, evidence from the Roadmap project suggest that this will be unlikely. Future budgets will need to take account of this. Similarly, developments on both new nuclear and power sector CCS have been slower than anticipated in the last five years and they could be expected to play a smaller role in the run-up to the fifth budget than perhaps originally anticipated.

- **It should aim to deliver parity with our EU commitments.** It stands to reason that competitive distortions are minimised where climate change ambition and action is agreed at the highest possible level, with the aim of moving towards a global level playing field. Further to this, basic economics tells us that where emissions reduction targets, and mechanisms to drive them, have the widest possible scope (i.e EU rather than UK or even regional targets), emissions reductions will be achieved most cost effectively. Whilst carbon budgets can add greater political certainty from a UK point of view, they should still broadly aim to align with EU targets and any post-Paris global targets.
- **It should reflect the decarbonisation ambitions of key global players.** There is an argument for the UK to have ambitious climate change goals even in the absence of equitable action from others, such as the US, China and India, but only if it can clearly be shown that this will benefit our economy. However, it is also worth noting that strong commitments from the UK and EU ahead of the Copenhagen COP did not convince other actors to follow suit. An effective carbon budget must strike a balance between ambition and parity with what other comparable nations are targeting.
- **Production vs Consumption Emissions.** Another key element of the UK's carbon footprint that needs to be considered to a much greater extent is the carbon embedded in imported goods. We agree that the CCC's recommendations should focus primarily on domestic emissions because the government has more control over them. However, we would like regular CCC monitoring and reporting of embedded carbon to ensure our emissions are not simply being exported overseas and provide the evidence base to begin properly addressing this major element of the UK's carbon footprint.

D. Other issues

The Climate Change Act requires that in designing the fifth carbon budget we consider impacts on competitiveness, fiscal circumstances, fuel poverty and security of energy supply, as well as differences in circumstances between UK nations. High-level conclusions on these from our advice on the fourth carbon budget were:

- **Competitiveness** risks for energy-intensive industries over the period to 2020 can be addressed under policies already announced by the Government. Incremental impacts of the fourth carbon budget are limited and manageable.

- **Fiscal impacts.** The order of magnitude of any fiscal impacts through the 2020s is likely to be small, and with adjusted VED banding and full auctioning of EU ETS allowances could be neutral or broadly positive.
- **Fuel poverty.** Energy policies are likely to have broadly neutral impacts on fuel poverty to 2020, with the impact of increases in electricity prices due to investment in low-carbon generation being offset by energy efficiency improvement delivered under the Energy Company Obligation. Incremental impacts through the 2020s are likely to be limited and manageable through a combination of further energy efficiency improvement, and possible income transfers or social tariffs.
- **Security of supply** risks due to increasing levels of intermittent power generation through the 2020s can be managed through a range of flexibility options including demand-side response, increased interconnection and flexible generation. Decarbonisation of the economy will reduce the reliance on fossil fuels through the 2020s and thus help mitigate any geopolitical risks of fuel supply interruption and price volatility.
- **Devolved administrations.** Significant abatement opportunities exist at the national level across all of the key options (i.e. renewable electricity, energy efficiency, low-carbon heat, more carbon-efficient vehicles, agriculture and land use).

S

The department of Business Innovation and Skills is due to publish a revised version of its 2012 report '[An international comparison of energy and climate change policies impacting energy intensive industries in selected countries](#)' which details and projects the increases in energy prices resulting from government policy through to 2020 from key EU countries as well as global competitors such as the US and China. The updated report will naturally reflect the introduction of the UK's own compensation package as well as changes in policy around the world.

Further to this, account should be taken of DECC's updated [Estimated impacts of energy and climate change policies report](#). Whilst the Committee has produced a similar report, it should be noted that this made no allowance for the variety of industrial energy consumers and the different prices they face.

The Committee should also consider evidence on the EU ETS's impact on competitiveness from individual sectors. Eurofer has conducted some work in this area, but is looking to build on it further.

Question 14 *What new evidence exists on differences in circumstances between England, Wales, Scotland and Northern Ireland that should be reflected in the Committee's advice on the fifth carbon budget?*

EEF does not have any specific evidence to put forward with regards to this question.

Question 15 *Is there anything else not covered in your answers to previous questions that you would like to add?*