

The Fifth Carbon Budget - Call for Evidence

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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?*

No comment

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?*

It is hoped that the UN talks in Paris will yield legally binding GHG commitments that put the world on track to keep within a likely 2°C temperature rise. It is essential that the UK and EU push for other countries to adopt similar carbon reduction targets to ensure the climate objectives are met and countries can work together to maximise benefits, reduce costs and create a level playing field.

However, if the talks fail to secure legally binding targets from all countries or the collective level of ambition falls short, it is important that the UK remains committed to the Climate Change Act and puts in place interim carbon budgets to reach the 2050 target in a way that is both economically efficient and practicable. Given that the UK is about to replace a significant amount of its energy capacity, it has a unique opportunity to replace it with new low carbon generation. Sticking to the long term cross party carbon framework has helped businesses invest in new technologies and capacity, and deviating from the targets would threaten further investment.

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 emissions reduction, either before the end of Paris or after Paris?*

DONG Energy welcomes the adoption of EU wide GHG reduction targets for 2030, however the level of ambition does not sufficiently go beyond business as usual to drive the level of necessary investment in low carbon energy. The removal of

binding renewables targets significantly reduces visibility in the sector, making it harder to plan ahead and attract investment. Economy wide GHG targets are too broad to give players in each sector sufficient information about the pace of carbon reduction required.

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 was the first country to adopt legally binding GHG targets for 2050 and this puts it in a strong position to push for others to adopt similarly ambitious and binding targets. The UK's negotiation voice as part of Europe will also be important, given the significant trading power that the region represents.

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?*

Modelling suggests that the power sector will need to be largely decarbonised by 2030 if the longer term 2050 reduction target is to be met. Early power sector decarbonisation is both economic and deliverable, as the required technology exists and there are several options for large scale deployment of low carbon power generation, including offshore wind. Decarbonised electricity will also be an important energy source for the other sectors.

Early decarbonisation of the electricity sector is particularly important for the UK as approximately 20% of its thermal capacity is due to retire as a result of age or environmental legislation by 2020. The lead times, from inception to commissioning, of some types of low carbon plant that can deliver at scale can be ten years or more, so getting the investment signals right and well ahead of the point of delivery is vital. Developing an offshore wind farm can take as long as ten years from start to finish, The Hornsea One project for example has been in development since 2010 and won't be fully commissioned until post 2020. The lead time for investment in the manufacturing sector is also long, and sufficiently long term signals are needed to ensure there is sufficient investment in the specialist equipment and services required.

The offshore wind industry has already made good progress towards its 2020 cost reduction target and the recent Cost Reduction Monitoring Framework report suggests that the levelised cost of offshore wind has fallen by 11% between 2010-14, from £136/MWh for projects at works completion in 2010-2011 to £121/MWh for projects reaching final investment decision (FID) in 2012-2014.

However this cost reduction has been achieved on the back of a clear steer from government that there will be a pipeline of future projects. The Climate Change Act and carbon budgets have provided reassurance to the sector. But more importantly, these have been over laid by a fixed renewables target and subsidy regimes underpinning it, which has given the industry a clear sense of direction to 2020. Many of the technological improvements which have driven this cost reduction such as larger turbines and foundations, are a result of risks taken by both developers and manufacturers that have only taken place on the back of a clear pipeline of future projects and orders. Eventually there will be a limit to the amount of cost reductions that can come from deploying existing technologies and practised techniques – the future of the industry and cost reductions will be dependent on sector wide innovation, which will be fuelled by sufficient investment.

Large scale, capital intensive projects like offshore wind can't be done off the balance sheet alone and projects are heavily dependent on attracting third-party finance. Financing projects is easier and cheaper if there is a certainty of a future project pipeline and steady economic return.

A pipeline of projects will not only be important for cost reduction but will also have an impact on deliverability. New technologies and approaches need to be developed to enable the UK to exploit the significant offshore wind resource and enable projects to be based in a wider range of sites, including deep water.

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?*

No comment.

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?

No comment.

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

Although the carbon budgets provide a strong signal in terms of the future direction of the UK economy, the range of possible energy outcomes remains wide. Even scenarios which result in the same 2030 carbon intensity have such a wide range of possible outcomes in terms of capacity between different types of renewables, CCS and nuclear. There is a real concern that post 2020, the lack of direction as to what is needed in the electricity sector once the renewables target expires will result in less investment in new technology and a reduction in the rate of cost reduction.

A continuous pipeline of projects is required to boost competition between developers, turbine and balance of plant suppliers and investors to continue to attract investment in the specialist equipment and technologies required to bring costs down and enable deployment at a wide range of sites.

An extension of the Levy Control Framework will be needed to demonstrate to the low carbon sector that there is sufficient funding for new projects. However extending the LCF on its own won't be enough as it gives very limited visibility of the volume of renewables needed let alone offshore wind, which needs some volume forecast to continue on its cost reduction pathway:

- The volume of low carbon it delivers will vary significantly depending on future electricity and carbon prices and the actual cost reduction of each technology - revising the LCF up or down if these factors change significantly may be complex and may not happen in practise.
- It gives little or no visibility on the volumes of each technology provided due to unknown splits between technologies within pots and between pots in the longer term.
- Proceeding with the LCF alone might result in an early merging of allocation pots which could result in only the most mature technologies going forward not a range - this would be bad for innovation and security of supply as it wouldn't bring forward a range of technologies

Thus there needs to be a volume based approach for less mature technologies such as offshore wind in addition to the carbon budgets and extension of the LCF. One option to ensure that the cost of offshore wind continues to fall would be to adopt a 'falling auction' approach whereby offshore wind is allocated a minimum volume (GW) per year from 2020 to 2030 and developers would be able to compete to

secure projects up to this volume. Applying a price cap for bids (ie a maximum strike price) that would fall each year would ensure the cost of the set volume would also fall each year (assuming the electricity price didn't fall faster than the price cap).

Any projects above the set volume would be able to compete against other technologies in a separate auction. This would give the offshore sector the volume certainty it needs to further reduce costs whilst ensuring Government is better able to forecast and limit expenditure.

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?*

No comment.

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?*

As a business deciding whether or not to make large long-term investments in new offshore wind farms in the UK, the carbon budgets have been important in terms of showing us the direction and pace of decarbonisation in the UK. Understanding that

there is a market and demand for new low carbon generation helps increase confidence and enabling us to better plan across our portfolio of projects. Long-term visibility helps with the following areas:

- **Procurement** Our pipeline of projects has enabled us to enter into framework agreements with our suppliers, which have escalating breakaway costs. By placing bulk orders from cable, turbine and substation suppliers, we have been able to benefit from economies of scale; driving down costs and avoiding bottlenecks occurring in the supply chain.
- **Development and deployment of new technology** The visibility of future projects has given us and our suppliers the confidence to invest and develop new technology. For example we worked with Siemens at Gunfleet Sands to trial their new 6MW turbines. Both DONG and Siemens took on additional risks and costs on the demo project, but it enabled the turbines to then be deployed at Westermost Rough wind farm (WMR), at a faster pace and in a safer way.
- **New installation methods and equipment.** Our suppliers have also made important investments based on a pipeline of projects. Vessel suppliers have been able to trial new bespoke models, designed specifically for use on larger turbines. One example of this is the Sea Installer used to install Siemens' 6MW turbines, which helped to reduce installation time and therefore costs. At WMR, new blade lifting equipment was used for the first time, which was specifically designed to cope with even rougher weather conditions, helping us to install the blades more efficiently and safely.
- **New infrastructure** As a developer we have been able to move from a project by project basis, to developing a portfolio of projects, which has allowed us to make much larger investments which can benefit multiple projects. For example, we entered into a ten year lease at Belfast Harbour, as we could use it both as a base for the construction of the West of Duddon Sands wind farm and as a harbour for future DONG Energy projects, including Walney Extension. This helped encourage a £53 million investment in the port, the largest in Belfast Harbour's history.

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?*

The carbon budgets and 2020 renewable target have enabled the UK to take the lead in offshore wind. The UK now has more installed offshore wind capacity than anywhere else in the world. There has also been close collaboration between government, industry and universities, leading to significant innovation and learning in the water.

The UK has become the world leader in offshore wind and a number of our UK projects have been world firsts:

- We were the first to commercially install Siemens' 3.6MW turbine at our Burbo Bank project in 2007.
- We were also first to deploy Siemens' 6MW turbines offshore at Gunfleet Sands demonstration project – now installed commercially at our Westernmost Rough project
- Our West of Duddon Sands project was the first to use the custom built offshore wind installation harbour in Belfast
- We have an ownership stake in the largest operational offshore wind farm in the world – London Array.

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

No comment

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).

Question 13 *What evidence should the Committee draw on in assessing the (incremental) impacts of the fifth carbon budget on competitiveness, the fiscal balance, fuel poverty and security of supply?*

A strong carbon budget underpinned by volume based technology targets in the power sector will help the renewables sector continue to grow, bringing multiple benefits to the UK economy.

The UK has a significant offshore wind resource and we should be seeking to exploit it at lowest cost to help maintain our competitiveness on a global stage. We are seeing a growth in specialist offshore wind manufacturing and services in the UK. A high deployment of renewables also significantly reduces imports of fossil fuels, helping with security of supply.

If the right signals are there to suggest that substantial volumes of low carbon technology will be required it will drive competition, as more players will invest in the market. The offshore wind industry has already witnessed significant cost reductions, that have largely been achieved by deploying larger turbines ahead of schedule. Technological innovations which have been achieved on the back of a sustained industry and a strong pipeline of projects are lowering maintenance costs and increasing the quantity of energy produced from offshore wind farms. Offshore wind is already helping to contribute to a secure future energy supply, with one of the highest load factors of all renewable technologies.

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?*

No comment

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

No comment