

## 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.

**This response is from Mitsubishi Electric UK. Please contact *James Timbs-Harrison, Product Manager* [james.timbs-harrison \[at\] meuk.mee.com](mailto:james.timbs-harrison[at]meuk.mee.com) for further information.**

## 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 CO<sub>2</sub> 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?*

N/A

**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?*

Mitsubishi Electric UK (MEUK)'s position is that the Committee should seek to form a justifiable and researched position on how much carbon it is possible to emit for the Carbon Budget.

After that, the committee's advice may include practical measures to retain emissions within that target.

Given the seriousness of climate change, the United Kingdom should be seeking to take a leadership role. MEUK advocates that this is a powerful ambition for the country- and the CCC should encourage this.

**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?*

There are high expectations of the Paris talks, given business support, changes in international posturing on the matter of climate change from China, President Obama's emphasis on the matter in his second term for example. However, in the past at climate talks, expectations have been let down.

Specifically with regard to the EU 2030 package and Europe's current stance; the

overarching EU targets are bold, and welcome. However, given that much of European action will be enacted, enforced and established by national governments, there is the prospect of less stringent action than desired being the result of the 2030 package. The UK should lead by example, and continue to be bold in its aims and actions. One manner in which this could be demonstrated would be a renewed commitment to renewable energy and specifically renewable heat drafted with the ambition of securing the UK's 2020 carbon objectives.

**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 80 percent reduction target is ambitious.

The first carbon budget (2008-12) was met through a combination of the impact of the recession and low-carbon policies. If the economic recovery continues, this target may become harder to achieve. The UK's role in international discussions will be strengthened if it can secure economic growth and reduce carbon emissions. Conversely, a failure to decouple carbon from growth will weaken the United Kingdom's ability to reduce emissions.

The figure of 80 percent is rather arbitrary when it comes to supporting the country's role in international negotiations. What is relevant in driving investor behaviour is how the actual hunger to achieve those emission reductions delivers results in the short to medium term.

## **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 gCO<sub>2</sub>/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?*

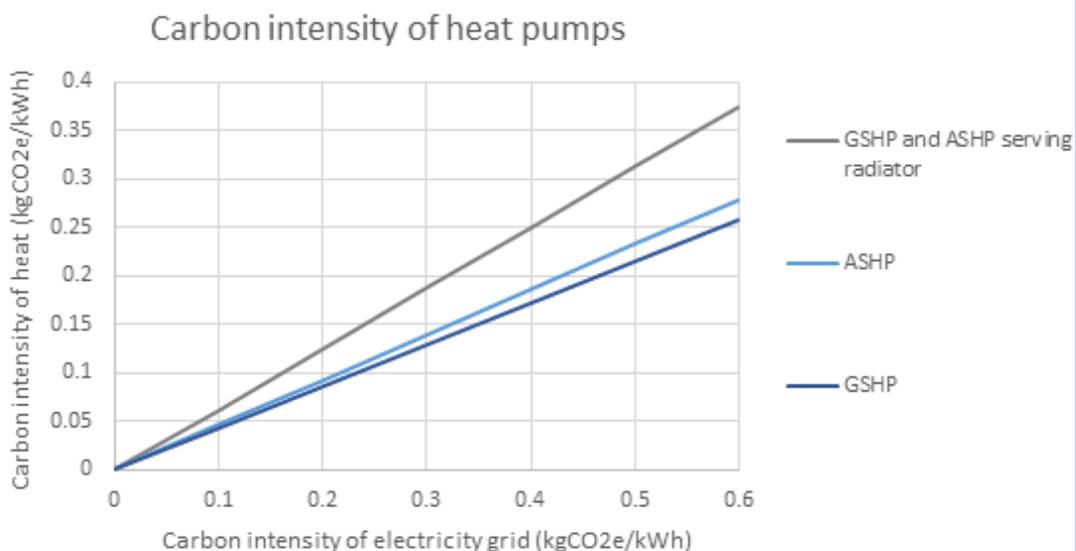
The most cost effective route to reducing energy costs (power generation being a chief cause of carbon emissions in the UK) is more efficient energy use.

On the domestic front, conserving energy- first through primary measures such as loft and wall insulation is the most direct route to cutting requirements.

Beyond those measures, efficient technologies such as Mitsubishi Electric's Ecodan heat pumps are a useful means of decarbonising heating.

One area previously overlooked with respect to Heat Pumps is the potential to deploy heat pumps in electrically heated properties which reduces power requirements and substantially cuts emissions even at today's grid carbon intensity. Compared to conventional electric heating, (frequently used in rural locations and in social housing), heat pumps deliver 320 percent more heat for the same energy input. Over time, heat pumps will increasingly become common.

It should be noticed, that heat pumps are better placed to deliver reduced emissions in a decarbonised grid. Utilising DECC figures with regard to potential decarbonisation of the grid, one can see the greater the penetration of green electricity generation facilities into the country's generation portfolio, the greater the utility of heat pumps in reducing emissions. The CCC's views on decarbonisation of the power sector will therefore be very important.



**Source: Ecuity Consulting LLP**

**The CCC has previously stated, in the fourth carbon budget, technical report chapter three:** *'New evidence on the capital costs, performance and durability of heat pumps suggests that they are less cost-effective in the 2020s than we previously assumed. We have therefore revised downwards our estimates of heat pump uptake across buildings, including 3 million fewer heat pumps in homes by 2030 (down from 7 to 4 million). This would reduce abatement from heat pumps from 31 MtCO<sub>2</sub> to 14 MtCO<sub>2</sub> in 2030.'*

However, a more sophisticated analysis of heat pump benefits- including the fact in a well-insulated house they can operate in a *smart*, or demand-sensitive manner, as well as the savings they offer to electrically heated households would likely increase

the utility of heat pumps. Mitsubishi Electric would argue that the CCC should actively encourage the adoption of heat pumps early on, opening up opportunities for economies of scale in the deployment of the technology earlier.

Please see answer to question 7 with regard to the extent to which heat pumps can contribute to carbon emission reductions, and when.

**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?***

Consumers have an important role to play through behavioural change and acceptance of new technologies. They ought to be empowered to do so. Smart Meters and Smart Heating Controls, which can provide consumers with the appropriate level of information and the ability to control their heating should become more commonly available.

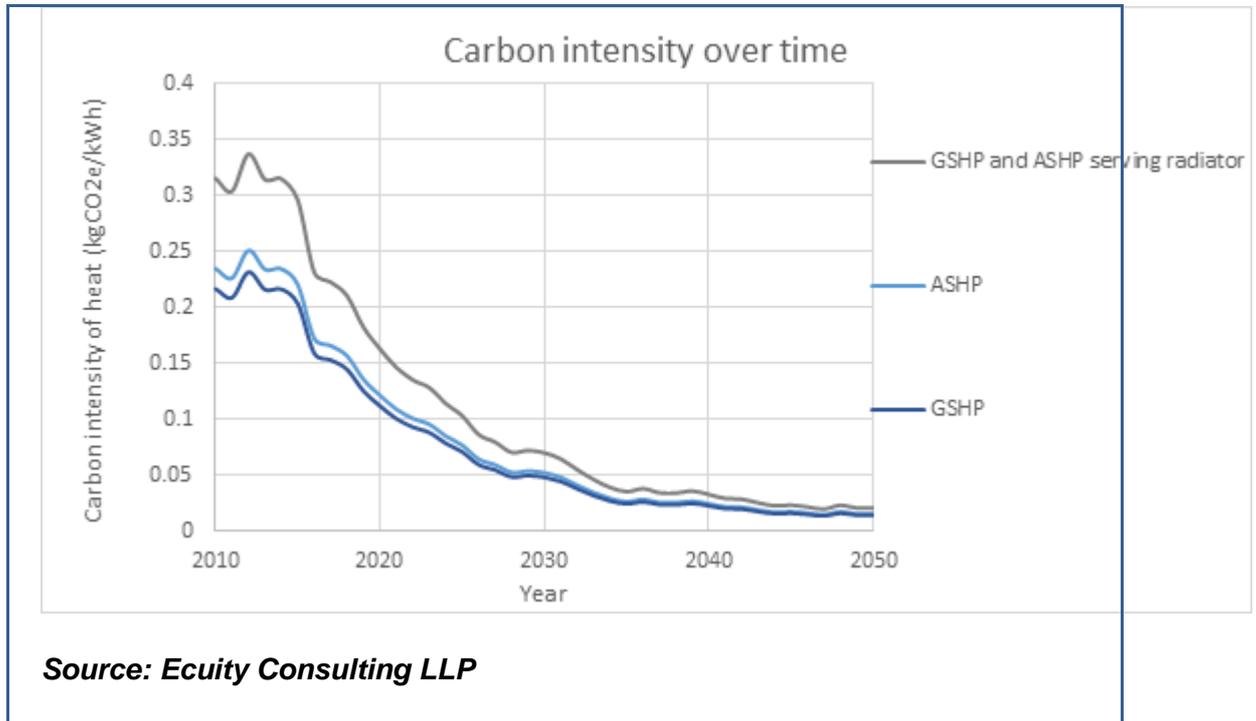
Further use of automated systems which reduce the requirement for energy, or which use it when most appropriate time (in terms of fluctuations in demand) can help reduce cost, as well as emissions.

Heat pumps are one technology which can be utilised in this manner, are able to be controlled remotely potentially playing a part in aggregated demand side response. Inverter driven equipment could also play a part in reducing power draw rather than completely switching off.

**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?***

Incrementally, reducing carbon from our economic activity will become harder- assuming that the 'low hanging fruit' is accessed early on.

Again, using DECC's predictions for the change in our generation portfolio, one can see that further reductions in emissions will be more difficult, and that electrification of heating may be increasingly important in 'deeper' decarbonisation.



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

Long term certainty for the Renewable Heat Incentive could help industry reduce costs of low carbon heating technology at a more rapid rate. A roll out of heat pumps focused on conventional electrically heated properties in addition to the RHI programme could generate significant cost and carbon savings.

Removing barriers to uptake for heat pumps could ease and their deployment. For example, DNO grid connection fees and administration costs are often charged when a heat pump is connected. However, on an electrically heated property, this is unnecessary- heat pumps would reduce demand on the grid at the point that household's MPAN is connected to the grid.

Policy should facilitate technologies which can reduce carbon intensity, or total energy requirements. Heat Pumps are part of this technological solution, and policy should recognise this.

**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?*

The principle omission from the National Infrastructure plan is a requirement for energy efficiency and distributed generation of renewable energies to be included as a national infrastructure target.

Such a strategy would seek to deliver energy efficiency measures in a deep retrofit of Britain's homes and businesses. Given the significant reduction in energy use these upgrades would cause, this would be a cost effective route to deliver a significant reduction in greenhouse gases.

The UK needs to lead by example- and a constructive plan to overhaul our current infrastructure in a manner to facilitate the future low-carbon economy' which we must be part of, is an ideal route forward on this regard.

### **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?*

N/A:

**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?*

N/A

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

N/A

#### **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?*

N/A

**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?*

N/A

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

N/A: