House of Commons

Environmental Audit Committee

Oral evidence: The Seventh Carbon Budget, HC 1327

Wednesday 12 November 2025

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Watch the meeting

Members present: Mr Toby Perkins (Chair); Olivia Blake; Julia Buckley; Carla Denyer; Barry Gardiner; Chris Hinchliff; Sarah Gibson; Martin Rhodes; Dr Roz Savage; John Whitby.

Questions 1 - 25

Witnesses

I: Shaun Spiers, Executive Director, Green Alliance; Professor Joeri Rogelj, Professor of Climate Science and Policy and Director of Research, Imperial College Business School and Grantham Institute – Climate Change and Environment.

Examination of witnesses

Witnesses: Shaun Spiers and Professor Joeri Rogelj.

Q1 **Chair:** Welcome to the latest meeting of the Environmental Audit Committee. This is part of our work looking at the seventh carbon budget. I am very pleased to have with us Shaun Spiers, executive director of Green Alliance, and Professor Joeri Rogelj, who is professor of climate science and policy director of research at Imperial College Business School. Welcome to both of you.

I will start by asking: how confident are you that the CCC's advised level and approach for the seventh carbon budget sets the UK on a credible pathway to reach net zero by 2050? I will start with Professor Rogelj.

Professor Rogelj: Thank you very much for the opportunity to provide evidence to this Committee. The CCC advice on the seventh carbon budget is based on a very diligent and detailed analysis of the options, opportunities and challenges. The sequencing of the budgets, from the first to now the seventh, also sets out a clear and unmistakable path to achieve the UK's 2050 net zero target. In that sense, I have confidence that this carbon budget sets out a credible and ambitious target.

However, for me, whether this translates to a credible path will really depend on implementation and the translation of these targets into action. That translation depends on the signals that the Government are willing to provide, the policies they will put in place and the investments that they are willing to make. Looking back, earlier carbon budgets have been achieved. This provides good confidence.

Q2 **Chair:** I will stop you for a second, if I may, because you are slightly pre-empting questions that we are going to come to. At this very early stage, we are just wanting to look at this plan, but we will look back at CB4 to CB6.

Mr Spiers, how does the level of ambition in the CCC's advice for CB7 compare with earlier carbon budgets? Does it represent a step change in policy intent or is it a natural evolution of the existing pathway?

Shaun Spiers: Thanks for the invitation. It is a natural evolution. That is the whole point of how the Climate Change Act and the carbon budgets work. They give consistency over time. If anything, carbon budget 6 was the step change because it included international aviation and shipping. It was the first net zero carbon budget.

It is an evolution. As you get into the 2030s, things become harder. A lot of decarbonisation up to this time has not really been seen by people. It has been to do with decarbonising the power system. Things will get harder, but it is an evolution.

Q3 **Chair:** Professor Rogelj, is the balance between ambition and deliverability in the advice provided by the CCC right? Are there any particular risks of either overpromising or underdelivering, given the current policy investment and infrastructure landscape?

Professor Rogelj: I want to put this in the context of the recent developments in the area in which I work, which is the progress of climate change. In the past few years, the experience that we have had with climate change has shown that climate risks are happening at lower levels than were expected initially. In that sense, the aim of pursuing a 1.5°C limit or to limit warming to as low levels as possible, to which this carbon budget contributes, is more relevant than ever.

In that context, even acknowledging the challenges that exist at a political level, this carbon budget provides a balanced level of ambition towards the goal of climate stability.

Q4 **Chair:** Mr Spiers, the UK is seen as a leader on territorial emissions. When it comes to consumption, we have a much more mixed picture. Does the way that we account for carbon in the UK enable us to offshore quite a lot of the production that we continue to use? That has economic consequences and political consequences, but it also potentially enables the UK to be an apparent world leader while causing through consumption a huge amount of carbon emissions. If so, should the Government rethink the way that they account for carbon and include not just what is produced here but what we cause to be produced?

Shaun Spiers: Yes, that is a charge that is very much in the news now. The Climate Change Committee has recommended that the Government should set non-binding targets and monitor the extent to which it is exporting emissions. That would be a very good idea.

We have always been a global trading nation. There is an idea that decarbonisation is the cause of our deindustrialisation and we are offshoring all our emissions. There is a lot of evidence to suggest that that is not so. There are many reasons why we lose and gain industries. Blaming everything on the Climate Change Act and the decarbonisation targets, which is what is happening at the moment, is just false.

Q5 **Chair:** Thank you for that. Professor Rogelj, the calculation of global and therefore UK carbon budgets faces considerable uncertainty. How does this affect the CCC’s emissions trajectory and their recommendations on carbon budgets?

Professor Rogelj: I am saying this in the context that I have been the responsible author for calculating global carbon budgets for the Intergovernmental Panel on Climate Change for the last decade. The global carbon budget is conceptually different from the carbon budget that the CCC and therefore the Government are considering.

The global carbon budget is the total amount of carbon dioxide that we can ever emit to stay below a limit. It is a global value. It tells us that at some point we need to stop emitting. We can estimate this. When we do that, we also estimate confidence intervals around it.

Policy advice and the setting of carbon budgets and targets can take that uncertainty into account. It is really important to understand under which conditions the global carbon budget, which defines what we should be doing at the national level to meet our temperature goals, is larger and, particularly, under which conditions it is smaller.

In that context, we also need to understand which conditions we can influence and which we cannot. For example, if we emit more methane, the global carbon budget will be smaller. That is a lever that we can influence. There are levers that we cannot influence. If the climate turns out to be more sensitive to our emissions at the high end of our current scientific estimates, the carbon budget will be smaller.

Typically, what these uncertainties tell us is that there is no avenue of measures that we can just put aside. We should really look at this in all areas. We should look at action in all areas. To hedge against the scientific and physical uncertainties of how the climate will respond, the best strategy is to reduce the amount of emissions that we put into the atmosphere as rapidly as possible.

Q6 **Chair:** I want to look at how the UK's emissions trajectory, as proposed by the CCC, compares to similar international nations. How do you feel the UK's proposed emission trajectory compares in terms of both pace and credibility with other similar major nations?

Professor Rogelj: The UK has historically been seen as a climate leader. We had the Climate Change Act, the net zero target and international leadership at COP26, which led to the large global wave of net zero targets. The UK is a nation that champions science and evidence in international policy, including in the Intergovernmental Panel on Climate Change. With that leadership, over 100 countries in the world have net zero targets, including China and India, as well as the EU.

However, research that we have done shows that many of those targets lack credibility. It is not credible that they will ever be achieved. We have identified a few aspects that increase that credibility, such as the target being set in law and there being a plan towards its achievement. Here the UK does really well. Compared to many other countries that have set long-term targets, these carbon budgets carve out a credible path towards net zero. It is challenging but it is credible, because there is a plan. That is in terms of the trajectory.

I would like to compare the level of the carbon budget to the EU's figures. For full disclosure, I am a member of the European Scientific Advisory Board on Climate Change, which is like the EU's CCC. We advise the EU on what its 2040 target should be, which is in the middle of the seventh carbon budget period. The board advised the EU to take a 90% to 95% reduction relative to 1990. This compares to the seventh carbon budget reduction, which is roughly comparable for the entire period, of 87%. The EU took up the lower or weaker end of our range, 90%, with the caveat that it would allow the use of high-quality international credits to reach that 90%. In effect, the domestic reduction will be less than 90%.

This gives you a bit of an indication where the roughly 87% reduction in the seventh carbon budget lies compared to our largest neighbour.

Q7 **Chair:** To be clear, the 87% is not relying on credits; it is relying on actual reductions.

Professor Rogelj: As far as I understand, that is true. We will come back to that later in the aviation sector.

Q8 **Dr Savage:** Thank you very much for coming in today. It is encouraging to hear that the UK Government have a plausible roadmap for achieving our targets.

Looking at the Climate Change Committee's advice on the seventh carbon budget, are there some immediate and additional policy decisions that the Government would need to make, beyond those already set out in the carbon budget and the growth delivery plan, to ensure delivery within the period of the seventh carbon budget?

Professor Rogelj: I want to start out by saying that having a plan is good. It is really good. It is why we can now discuss it and highlight these gaps. That is a really strong starting point.

However, when we look at the plan—when I say "we," I mean experts at Imperial College and at my institute—there are a few policy gaps and questions that could be looked at further. On aviation, for example, the Government seem not to be following the CCC's current advice in the plan on demand limits; they are really looking at efficiency and technological options. Our understanding is that both of those will be necessary and that there are quite a few challenges to scale the technological options effectively. We will come back later to how to deal with that uncertainty. The plan also hints towards allowing the use of offsets to meet the aviation target, which just pushes action elsewhere without ensuring the transformation of activities in the UK.

Another aspect where there could be more focus is on greenhouse gas removal. The plan aims to rely on greenhouse gas removal towards the seventh carbon budget and beyond, but scaling that will be challenging and there is no clear plan yet on how it will be achieved, particularly in light of decades of challenges to scale it in the real world.

Finally, looking at the plan, there could also be missed opportunities to cut emissions and deliver other co-benefits through behavioural change, which is basically active travel and healthier diets. Research that we have done shows that behavioural change can have incredible co-benefits for the health sector.

Q9 **Dr Savage:** Yes, that looks like it could be a win-win-win that we are failing to exploit at the moment.

Mr Spiers, to what extent are current UK policies on energy growth and industry sufficient to deliver the emissions reductions that we need for the seventh carbon budget? If there are gaps in those policies, which areas need to be strengthened now in order to reduce as much as possible potential delivery risks in the future?

Shaun Spiers: There are a few gaps. The biggest risk is to energy prices generally and electricity prices in particular. Unless something can be done about that, you reinforce this idea that decarbonisation equals deindustrialisation and you see all the opposition to climate policies that we are seeing now.

There is an urgent need to bring down prices both for industry and consumers. I hope something will be done in the Budget more than just removing VAT, which is not the best option for either equity or long-term deliverability.

On industry more generally, there are strong policies in place for hydrogen and CCS, but the Climate Change Committee has moved increasingly to suggest that electrification is the real path forward. There is a relative lack of clear direction there. In a way, things have even gone backwards on helping industry to decarbonise. The industrial energy transformation fund has been cut and not replaced.

As you move into the seventh carbon budget, you increasingly see that there is a requirement for households and industry to make up-front capital investment, which will yield economic benefits in the longer term. There is a natural resistance to doing that if there is no short-term economic benefit. The Government need to find some way of pump-priming those investments, both for individuals and industry.

Q10 **Dr Savage:** I have my own reservations about putting all our eggs in the electrification basket, but that might be outside the scope of our inquiry today.

Shaun Spiers: It is not all the eggs, by the way. There is clearly a place for hydrogen, but it is slightly less of a place than was thought. Technology has moved on. Battery storage has come on hugely; industrial heat pumps have improved in efficiency and so on.

Q11 **Dr Savage:** Professor Rogelj, how effective has cross-Government co-ordination been when we look at past carbon budgets? Is there scope for better Government co-ordination in order to deliver on this one?

Professor Rogelj: The evidence in the carbon budget presentation clearly shows that until now what has been achieved could be dealt with quite easily by individual Departments. We have decarbonised or are decarbonising the power sector or the electricity sector, which is an important contribution to the 50% reduction that the UK saw in its emissions.

We are now coming to sectors and measures that are increasingly more integrated across the remits of different Departments. We will really need more integration and more joined-up working across Departments to deliver those measures. The easy things have been done and the challenging things are coming now. The co-ordination is part of the challenge. That is co-ordination between DESNZ, DEFRA and the Department for Transport, when you think about electrification, but, equally, it is also the Department for Business and Trade.

To give you a few examples of measures where that is absolutely essential, we need that kind of co-ordination to deliver the greenhouse gas removals that are being considered as part of the reductions in the seventh carbon budget. Equally, that applies to the electrification of transport and the built environment. Unless there is good alignment on electricity and energy prices, policies in one Department will simply not deliver or will deliver poorly and have an adverse effect that could be avoided.

Q12 **Dr Savage:** There is room for improvement, then. Mr Spiers, what oversight and accountability mechanisms would be most supportive of delivery against the seventh carbon budget, including making sure that that the pathway is resilient to any potential legal or practical challenges? What can Parliament do in order to support those mechanisms?

Shaun Spiers: It is a good framework. The annual reports to Parliament are good. The Climate Change Act has proven that it works and is open to scrutiny by Parliament. The process of approving the carbon budget needs to be a lot better than it has been in the past. This Committee has proposed that as well. Carbon budget 6 was debated for 17 minutes in the Delegated Legislation Committee and 65 minutes in the Lords Grand Committee. Clearly, it is a much more contentious issue now. People will expect Parliament to have proper approval of it, to debate it properly and consider its pros and cons.

The Office for Carbon Removal, which has been proposed by Alan Whitehead—it was originally proposed, I should say, by Green Alliance—is a great idea for tracking the viability of greenhouse gas removals and bringing some order to what up until now has been a relatively lawless environment. Greenhouse gas removals become much more important as we move towards the seventh carbon budget.

On legal challenge, there is a general view now that the Government are committed to delivering the seventh carbon budget and to delivering serious change, and it would be a distraction to have legal cases now, but it is all in the delivery. People will be looking at it over the next few years.

If I may just touch on the question you asked about join-up, the Government deserve a lot of credit for sticking the course of having this as one of its missions. Keir Starmer is going to COP. It is clearly a big Government priority. It is the economic opportunity of the 21st century, et cetera. That does not animate individual Government Departments, which have their own priorities. Unless DfT, DEFRA and DBT and other Departments lean into this increasingly, it is just going to get progressively harder to deliver these new areas of change as we go towards the 2040s.

Professor Rogelj: On the legal challenges, I just wanted to highlight that the International Court of Justice recently published its advisory opinion on climate change, in July 2025. In the context of the Government not always being very clear or decisive on how to deal with fossil fuel exploration and exploitation, it is probably good to note that the advisory opinion of the ICJ, of which the UK has been a big champion over many years and decades, has a key warning for the further exploration of fossil fuels.

If I can just cite it, it says that the "failure of a state to take appropriate action to protect the climate system from greenhouse gas emissions—including through fossil fuel production, fossil consumption, the granting of fossil fuel exploration licences or the provision of fossil subsidies—may constitute an internationally wrongful act."

Of course, the ICJ's international lawyers will be able to inform you more precisely on the standing of that, but my understanding is that it carries quite a bit of weight.

Q13 **Dr Savage:** The Climate Change Committee has highlighted that agriculture is going to be the UK's second highest emitting sector by 2040 and that the share of greenhouse gas emissions from agriculture is already greater than that from the electricity supply. Given that and the relatively slow progress on nature-based solutions—I will offer this question to both of you, for either or both of you to pick up—are you concerned that the delays to some of these key policies such as the land use framework and the peat ban are holding us back?

Shaun Spiers: Yes.

Dr Savage: That is good. I am glad.

Shaun Spiers: In a way, it comes back to this question about join-up between Departments. The land use framework would be a really good framework for resolving some of these things. DESNZ wants energy crops. What is the relationship between energy crops and food security? That is another Government aim. What is the relationship between that and restoring nature?

You need join-up there. You need to get back to the farming roadmap as well. The move from basic payments in the common agricultural policy to environmental land management schemes has been slightly stuttering and farmers need long-term certainty. The carbon impacts of farming absolutely need to be baked into that. We also need a food strategy as well.

Q14 **Carla Denyer:** Thank you, Professor Rogelj, for your timely reminder of the ICJ advisory opinion that fossil fuel subsidies, which the Government are currently providing, and new oil and gas extraction, which I understand they are considering, could put them at risk of climate litigation. That is very timely.

I am interested in the uncertainties and assumptions in the Climate Change Committee's report, especially potentially over-optimistic assumptions around some of the things that you have already touched on, such as carbon capture and storage, greenhouse gas removals and technical, rather than demand-based, reductions from aviation emissions.

The first question is for Professor Rogelj. The recommended pathway from the CCC relies on emerging technologies a fair bit. What is the right balance between proven and emerging technologies? If those technologies cannot be rolled out at the scale and pace that the pathway requires, what are the appropriate contingency plans?

Professor Rogelj: The transformation that we have in front of us towards net zero is challenging. It is becoming more challenging because the easy options have been taken.

If the easy or well-known options have been taken, that means we now need to venture into an area where we know less. That means we have more uncertainties and we need to make more assumptions. What is the right balance between emergent and known technology? That is a value judgment that I should not make for the UK, but I can make it in the context of what I think a priority in this policy might be, which is to deliver on the emission reductions that are required to bring about a safe climate.

What we know is that all current options should be pursued to the fullest. No option can be left off the table. We also understand that the pursuit of different options in parallel does not mean they need to crowd each other out. We understand and can plan for the fact that some of the options and measures that we will be putting in place will underdeliver. We can build redundancy into the system. We have such redundancy in IT systems and in energy systems. If you jump out of an airplane, you take two parachutes. We understand pretty well how to do that.

You do not plan to achieve a target by the narrowest margin; you build in redundancy. If one policy fails, you still meet your target. If everything works out or if uncertainty plays out in your favour, you overdeliver, transform faster or do it at a lower cost. You will have win-wins.

We also understand that some of the parts—maybe we will come back to that later—on the demand side can provide a really nice balance to some of the uncertainties on the technology side. There is another question about that later on.

Q15 **Carla Denyer:** That is really helpful. I agree.

Mr Spiers, in your opinion, are the timelines for the development and deployment of those emerging technologies realistic? Personally, I fear they may not be. How can Government policy support them either to be more realistic or to make more realistic assumptions?

Shaun Spiers: They are probably as realistic as they can be, given that you are looking forward to 2042. Earlier, the Chair said, "What is the danger of overpromising and underdelivering?" In past carbon budgets, we have overdelivered on the promises. Technology changes rapidly in ways that cannot be anticipated. I heard Emma Pinchbeck, the chief executive of the CCC, saying that when the first carbon budget was set it was assumed that the energy demands would be met through onshore wind, nuclear and biomass. Nobody anticipated the rapid success of offshore wind. There is quite a lot of anticipation of these S-curves in the plan. Frankly, if you do not get those S-curves, the world will be in a really difficult place. We need technology to take off. Some will and some will not. It is important to have backstops, as we just heard. I do not quite understand the squeamishness of this Government and previous Governments about behaviour change and demand management.

One of the interesting things about the seventh carbon budget report from the CCC is they tested a lot of their prescriptions for household changes with citizens' panels. What is being proposed makes life better. Everybody assumes that behaviour change and demand management means a hair shirt. It just means providing a decent bus service; providing alternative proteins that are as cheap and tasty as processed meat; and building 1.5 million homes that have baked in from the beginning sustainable travel, cycle paths and bus routes, et cetera. All this will make life better. It is not something to be avoided.

Q16 **Julia Buckley:** I will start with you, Professor Rogelj. The CCC's advice for the seventh carbon budget shows that the UK must now move beyond that early progress in power and light transport towards exactly those more complex challenges of decarbonising industry, agriculture and aviation. How confident are you that the UK's current policy and delivery framework is strong enough to drive this next phase of transition?

Professor Rogelj: The historical record of the UK delivering on its carbon budget provides a really good precedent that the UK has the capabilities to deliver on ambitious targets. It also shows that the Climate Change Act, together with other Government policies, is an effective way to drive decarbonisation. Here—this links a bit to previous questions—join-up between the different Government missions is absolutely essential.

We want to make the UK an international clean energy superpower, but equally we want to have an NHS that is fit for the future. We understand that a future under very high levels of climate change would be really hard for the NHS, but, equally, a future where we have less pulmonary disease, more active lifestyles and healthier diets would relieve the NHS of many of the patients that it needs to treat today.

I can give more examples like that, but it is very important for these missions to join up. Actually, I am going to give one more example because it is an important one. It is the first one: growing the economy. The vision that is being pursued in growing the economy should really look at how to grow an economy without being blind to the fact that our environment is changing. The environment is changing. That is undeniable. We will have to respond to that in some way or another.

We need to plan to build an economy that is fit for such a world where indeed, as the ICJ says, any further emission of greenhouse gases that could be avoided might be seen as an internationally wrongful or harmful act. Our societies will have to deal with levels of climate change that are beyond the 1.5°C level that we have initially been aiming for, and therefore we need to be resilient to more extreme weather.

Q17 **Julia Buckley:** Certainly, we hear that intention across the policy piece, but we did hear recently from those working in the sector, sector specialists, who asked us whether they are joined up across the delivery framework. Does the national infrastructure plan match the land use framework? Does it match the energy plan? Is that cross-departmental working succeeding in terms of those delivery plans? Are they aligned? Do they match?

Professor Rogelj: On that question I unfortunately need to pass, as I do not have the overview on how they currently match up. Shaun, I do not know whether you have a view on that.

Shaun Spiers: Almost certainly not, no. Joined-up Government is something that people talk about constantly. I am sure it is really difficult. I know you have done a report on it. The CCC has talked about the lack of join-up and so has the Institute for Government and the National Audit Office. There are a lot of plans and strategies. I am sure they are joining up as much as they can, but they are not totally joined.

Q18 **Julia Buckley:** On that point, I will come to you, Mr Spiers. The CCC's advice also stresses that progress in one sector must not be constrained by delays in another. For example, progress on grid capacity should not limit the roll-out of heat pumps or electric vehicles. Where do you see the most significant interdependencies? How can Government best co-ordinate across those Departments to ensure that that delivery is on track?

Shaun Spiers: The grid is probably the biggest one. Again, it is not just a story of the carbon budgets and net zero. We are going to have to upgrade the grid anyway. It is a big job. It is essential for growth, for doing away with constraint costs, for decarbonisation, et cetera. It is a top priority.

If I were to single out one other, I would say that getting greenhouse gas removers in place depends on carbon capture and storage, which is behind track as well. That is another dependency.

Q19 **Martin Rhodes:** Mr Spiers, just picking up on an earlier answer you gave to a colleague with regard to assumptions, the CCC's modelling assumes a particular pace of technology uptake and behaviour change. What risks arise if public response, affordability or innovation progress more slowly than expected? How can Government policy or public engagement help close that potential gap?

Shaun Spiers: That is a very good question, as you no doubt know. It is the big risk. There is a lot resting on the take-up of electric vehicles, which is fine, and heat pumps. There are really ambitious plans for heat pumps. I am going to probably get the stat wrong, but I think there are something like 11,000 heat pump engineers now. We need a 120,000 by 2030.

There is not a lot of public understanding about heat pumps. There is a lot of fear of them. There is a lot of fear about what happens if they come into your home. The price differential between the gas boiler and heat pump is not good enough now because electricity prices are too high. Again, we need to do something about energy prices and about public information to get people to trust that they will be able to have a heat pump reliably put into their home when their gas boiler needs replacing. There is no suggestion of ripping out gas boilers, but that is a key risk.

There are other assumptions in there, for instance, on the electrification of heavy goods vehicles. There are assumptions in the seventh carbon budget about that. There is not yet a Government plan on that. Again, I am probably going to get the stat wrong—I can write to the Committee—but HGVs are something like 13% of surface transport. Surface transport is still a really big part of the emissions we need to cut. Again, we need a plan to electrify heavy goods vehicles. There are lots of other areas as well, I am sure.

Q20 **Martin Rhodes:** Professor Rogelj, the CCC advises that decarbonisation should not simply offshore emissions through imported goods, fuels or supply chains. How can the Government manage those interdependencies, including clean technology manufacturing and low-carbon fuels, to safeguard the UK's carbon budgets and its competitiveness?

Professor Rogelj: Thanks for this question. The offshoring of emissions is a challenge, but I will come back to that in a minute. I also want to highlight the importance of the positive spillover effects of what the UK is doing. The UK is looked at as a climate leader. Many of the policies, measures and practices that the UK is putting in place—an example is the UK's emissions inventory—are copied by others globally. This ambition and leadership can also really mobilise the international community. Ambition in the UK will have a spillover effect internationally.

Of course, ambition domestically in the UK does not mean simply moving everything outside the UK or moving all emissions outside UK borders. If I understand correctly, from 1 January 2027 the UK will have a carbon border adjustment mechanism, which will tax imported goods at an equivalent carbon price or carbon penalty as they would be experiencing here in the UK and therefore reduce the compelling nature of offshoring emissions.

I would also like to highlight that the industrial challenges that the UK is experiencing are not necessarily decarbonisation-driven. These challenges need to be seen as part of a broader agenda. We need to imagine which industries the world will need in 2050 and think about how we can build that industry. That industry might not be the industry that built the 20th century in the UK; it might be a different industry. We can anticipate that and we can prepare the UK for those new industries.

Q21 **John Whitby:** The Climate Change Committee notes that meeting the seventh carbon budget will require substantial up-front capital investment, but, if we invest in those changes, we will produce £35 billion of cost savings by 2050. First of all, do you agree with those estimates? Are they deliverable? What do those estimates tell us about the potential risks and opportunities associated with transitioning to net zero?

Shaun Spiers: I do not mind making a start. Again, they are credible. The CCC is a serious outfit. James Richardson, the chief economist, is a serious person. They draw on real experts. They are credible. In anything looking ahead that far, there is plenty of potential to get things wrong.

The real issue for the UK economy is the world is only going in one direction. You can see the incredible investment in China in EVs and solar panels and the price of battery storage coming down and so on. I am sorry. I am going to bang on about electricity prices again. One of our business partners at Green Alliance, Heineken, recently invested in a heat storage facility in Portugal. It would be great if they could do something like that in the UK, but it would not be top of their investment list for future-proofing their factories because our energy prices are so high.

We really need to be getting to a position where, as industries modernise, which they are going to do, they have the confidence to modernise in a way that is going to help deliver the carbon budgets and future-proof them. In 10 or 20 years’ time, it is almost impossible to imagine, particularly with CBAMs and so on coming, that they are going to be competitive unless they take steps now to decarbonise. There is an up-front capital cost. For a lot of smaller businesses, there is a confidence issue in moving to a whole new way of doing things, which requires a lot of support, information and probably short-term capital expense. Unless that happens, we are just going to see more and more industries fold. That is not because of our net zero aims but because that is the way the world is going.

Q22 **John Whitby:** On a very similar subject, Professor Rogelj, how affordable are the recommended changes from the Climate Change Committee, particularly for households, small businesses and the public sector over the next decade? Can anything be done to make these changes more affordable?

Professor Rogelj: The right policies need to be put in place to shield households from piling up costs that can be carried elsewhere. I am sure Shaun also has some things to say here.

It is also really important to look at the broader picture and the joint benefits that will be delivered to households in terms of their quality of life, which is hard to measure but at least as important as the actual bill at the end of the month. Of course, bills are important. If they become excessive, we feel that as a strong infringement on our quality of life. Healthy and safe lives are also probably high on the public's list of priorities.

Q23 **John Whitby:** Mr Spiers, the Climate Change Committee stresses the importance of having a just transition. How can we ensure that the transition to net zero is done in as fair a way as possible? What are likely to be the trade-offs on affordability, competitiveness and equity between different groups and regions?

Shaun Spiers: Again, that is a really important question. The Committee is right to identify particular hotspots that are likely to struggle with the transition. Green Alliance is shortly going to bring out a report on the ceramics industry with the TUC and the GMB, which is quite an interesting coalition. Certainly, we have not done a lot of work with the GMB before, but we are very pleased to do so.

That work is really pointing out that there is no short-term route to decarbonise the ceramics industry. We are going to have to invest in the longer term in hydrogen and decarbonisation, but in the short term it is a choice between losing jobs, particularly in Staffordshire and Stoke and areas such as those, or accepting that we are going to have to carry on with relatively high carbon production. If we lose the jobs, we just import the stuff from other countries anyway.

We just need to be really attuned at every point to the need for fairness, even more so now that almost everything that could possibly go wrong in the country or in people's lives is now being blamed, by some people, on net zero and decarbonisation.

I am not sure how many of you are regular viewers of GB News, but that is definitely the narrative. It is also coming from a lot of the press and from political parties. If there is constant propaganda, you need to try extra hard just to make sure people are not left behind. That includes farmers in the agricultural transition. It is the whole area. We need to foreground fairness in how we achieve some pretty big changes in the next 25 years going to 2050. If we do not do that, we are not going to be able to achieve this.

Professor Rogelj: Can I add to that? There are some really important points here. On the point of fairness, it should not just be performative. You can also think about it procedurally. It has been shown that engagement with the public, having public panels and making sure that the public understand the context of what they are being asked to do, even if it is painful for a couple of years, increases the buy-in or willingness to do it and the satisfaction that it is being done because the vision is aligned towards a future that is ultimately desired by those members of the public.

Q24 **Chair:** Mr Spiers, on the issue of scrutiny of the seventh carbon budget, this Committee agrees with you. It is widely accepted that the scrutiny of carbon budget 6 in Parliament was totally unacceptable. We were pleased that the Government encouraged this Committee to play a pre-legislative role in looking at the recommendations that were being made and make some political suggestions as to options that the Government might want to consider in achieving those.

Beyond that, what other roles does Parliament need to play so that there is a greater democratic legitimacy to carbon budget 7 and greater buy-in from the general public? With each new carbon budget, the role of the general public in this achievement is going to grow. How can we make sure we bring people along with us in terms of that commitment to it? What else would you like to see being done in terms of that scrutiny piece?

Shaun Spiers: Having a full debate, giving the carbon budget all the publicity we can and interrogating the views of those who oppose the Climate Change Act and the carbon budget system is really important.

Hearing from industry is really important. Privately, industry is really concerned about the impact of the current anti-net zero and anti-Climate Change Act mood on future investment because future investment depends on long-term certainty, and that is now being called into question. They are less willing, as far as I can tell, to speak out publicly on this, in some cases. To interrogate some parts of industry would be a useful service.

The last thing is that this Committee, together with the EFRA and DESNZ Committees, set up the Climate Assembly UK under the last Parliament. That was a really rigorous process, but it was not, as it were, fully owned by the Government. It did not play the role that citizens' assemblies have in Ireland, for instance, in sparking a huge national debate. There is a very good film, which I think is still available on BBC iPlayer, looking at how people's minds were changed through the process of grappling with these issues.

If something like that could happen again, we could get a real national debate going about the benefits of this. It is not about a hair shirt; it is about leaning into the future, British leadership, good jobs, a better quality of life, cleaner air, et cetera. We could hear the opposition to it as well and interrogate that. That would be a real service.

Q25 **Chair:** You were talking about heat pumps earlier. The Government are betting really quite a lot on heat pumps being taken up, but the numbers are still pretty disappointing, despite the grants, in terms of the number of people going over to heat pumps. We heard talk this week that the Government might put back the ban on new gas boilers.

Have the opportunities for green gases and hybrid heating been under-considered? We are either putting everything into heat pumps, with the substantial outlay that will still be required for those and the fact that they are exclusive in terms of the types of properties that they are suitable for, or forgetting the ban and just carrying on with gas boilers, as we always did. Is there a sweet spot in the middle that the Government should be exploring a bit more?

Shaun Spiers: All the evidence that I have seen suggests that the way forward is heat pumps. They work in the coldest countries. They work in Scandinavia. They work in quite energy-inefficient homes now. They are massively improving in quality over time.

I would recommend that the Government lean into promoting heat pumps, making them affordable and getting much higher-quality advice because householders do not really trust the advice that they are getting on this. Do not start dabbling with other technologies.

We should make this carrot, not stick. The idea that people are going to come and rip your gas boiler out or whatever has not helped the narrative. It certainly did not help the narrative in Germany. We should not underestimate the fact that we are at risk of falling behind, which will make it harder to achieve the seventh carbon budget.

There is a whole story about advice, skills, which I have mentioned, price and so on. It is absolutely essential. If we do not make that transition, we are not going to be able to meet these targets.

Chair: Mr Spiers and Professor Rogelj, thank you very much indeed for your evidence. We will bring this first panel to a close and switch over. This sitting is suspended.