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 26 - 52

Witnesses

II: Mike Childs, Head of Science, Policy and Research, Friends of the Earth; Sam Hunter Jones, Senior Lawyer, ClientEarth; Professor Michael Grubb, Professor of Energy and Climate Change, UCL, and Strategy Director at Economics of Energy Innovation and Systems Transition.

Examination of witnesses

Witnesses: Mike Childs, Sam Hunter Jones and Professor Michael Grubb.

Chair: Thank you very much for joining us for the second panel. Ahead of the panel, Olivia Blake wishes to declare an interest. I will hand over to Olivia first, and then we will get started with the evidence.

Olivia Blake: I have recently taken up the role as chair of the Climate and Nature Crisis Caucus. Zero Hour provides support to help me with this work. It is in my entry in the Register of Members' Interests, if anyone wants to refer to it.

Chair: Thank you very much for that. You have started a trend.

Chris Hinchliff: I should probably also declare that I am a vice-chair of that same group.

Barry Gardiner: It all comes out now.

Carla Denyer: I am also a vice-chair of the Climate and Nature Crisis Caucus.

Barry Gardiner: I would like to object that nobody has asked me to be a vice-chair.

Chair: Yes, likewise. Hear, hear.

Sarah Gibson: I am a member of the APPG.

Olivia Blake: You should all join.

Q26 **Chair:** As one of the few who is not a chair or vice-chair, I look forward to hearing from our panel. We have an esteemed second panel. Can I ask you to introduce yourselves and your organisations, please?

Professor Grubb: I am Michael Grubb. I am professor of energy and climate change at the UCL Institute for Sustainable Resources and director of the Centre for Net Zero Market Design.

Mike Childs: My name is Mike Childs. I am head of science policy and research at Friends of the Earth. I have been there for over three decades, including working in the team that campaigned successfully for the Climate Change Act.

Chair: Congratulations. You must have been a very young man at the time.

Sam Hunter Jones: Good afternoon. I am Sam Hunter Jones, a lawyer at environmental law charity ClientEarth.

Q27 **Chair:** Professor Grubb, I will start with you. Looking back at carbon

budgets 4 to 6, what are the key lessons for ensuring that the CCC's advised seventh carbon budget is achievable in practice?

Professor Grubb: The carbon budget mechanisms worked well for most of that period. They were definitely a major driving force in looking at the whole structure of the electricity market, which led to the electricity market reform legislation in 2013. That has been pretty pivotal in delivering the carbon budgets, both the recent and present carbon budgets, and lays foundations.

Institutionally, the system was working well. Bipartisan support obviously helped. There was bipartisan sign-up to various elements along the road, right from the Blair and Brown Governments through to the coalition Government and the Cameron Government.

On the extent of the interaction between the Climate Change Committee and its analysis and the Government Department, which is now DESNZ, the political engagement worked pretty smoothly, though never perfectly. That created an environment of certainty for industry to invest and have confidence in where that was going.

We do not face the same situation today politically, certainly not entirely. That will not be news to people. Perhaps not surprisingly, as we dig deeper into this, one could argue with hindsight that the electricity transition was moderately easy because some of the very difficult political battles had already been fought in part over the extent of coal mining originally and then the use of coal in the electricity sector.

We are now encountering a number of areas where there are other interests at stake as the transition proceeds into additional sectors. There is a risk of capture from past successes. If we try to replicate those, they will not necessarily work with the challenges going forward.

We are entering a more complex terrain. We are definitely entering into a terrain where we need a more multi-sector policy. Just continuing on electricity emission reductions on its own is not going to achieve what is needed for carbon budgets 5, 6 and 7.

Q28 **Chair:** Mr Childs, we heard a pretty positive response there in terms of the lessons to learn. Can you point to areas where policy or delivery fell short in those previous budgets, whether on technology assumptions, insulation or infrastructure? What lessons might the Government learn from that to reduce the delivery risks as we move into areas that are more difficult to decarbonise in CB7?

Mike Childs: I would agree with Professor Grubb that the first part of delivering on the long-term Climate Change Act target has been the easy part. I definitely agree with that.

The cross-party consensus is still worth fighting for because that will be essential to deliver the remaining carbon budgets. I still do not understand why the Conservative party has moved against the Climate

Change Act, given its legacy of campaigning for it and Margaret Thatcher's speech on it. To suggest that the 2050 target is impossible 25 years early seems to be giving up on the potential for innovation and enterprise. Let us hope we can work to convince the Conservative party to come back on board with the Climate Change Act. That will be important.

Homes is clearly an area where we have challenges. Insulation did drop off a cliff after 2009. We have seen the implications of that for your constituents during the energy crisis. So many people who were living in cold homes were still having to pay astronomical amounts of money for their bills because the price of gas completely rocketed. We need to see a lot more focus on insulating homes. We are hopeful that the delay of the warm homes plan, which we expected before the climate plan was published last week, is being delayed for good reasons rather than bad reasons. We hope the Budget does not send us backwards on that measure. There is speculation that it might, but let us hope it does not.

Transport has been a significant challenge. As Professor Grubb said, nearly all the savings we have delivered to date have been through our electricity supply. When you combine surface transport and aviation, emissions from transport have flatlined since 1990. Effectively, the Department for Transport went rogue on the Climate Change Act. We are now seeing a shift towards EVs. That will deliver really important carbon reductions, but at the same time the DfT is going all out for aviation expansion. That speaks to a question that you asked in the earlier session. Are all the Departments really on board in this challenge? There are questions around that.

The other point I will just make is that Governments of all stripes have loaded costs on to energy bills that should probably have been paid through general taxation. That is now beginning to come back and bite us. Clearly, putting policy costs on to energy bills may be politically attractive because you can say, "We are keeping general taxation down," but it is not progressive. In fact, it is very regressive. It is now beginning to hurt many of your constituents, many people across the country.

Again, with the Autumn Budget coming up, we are hopeful that the Government will take measures to take those policy costs off energy and to move them into general taxation. That will help bring the public back on board. There is a real danger of losing the public mandate on climate change because it is seen to be unfair.

We published earlier this year a report called *The Fairness Test*. I do not know whether the Committee has seen it. Again, you touched on this in the earlier session. The delivery of climate change targets has to be fair; otherwise, it will not work. That has to be the focus going forward.

Q29 **Chair:** Mr Hunter Jones, do you want to add anything on lessons from where we have fallen short in the past? On the question about the public opinion on this, the Government spent around £100 billion subsidising the

general public's gas bills when we had the huge spike. You get critics saying, "Renewables need subsidies." Of course, we had a monstrous subsidy, but people did not feel like it was a huge subsidy because their bills were still going up. Is the way that the Government are handling this failing to get the public on side?

Sam Hunter Jones: To take the point around deliverability, we could compare the deliverability of what has happened with past budgets and where we are now. I would echo some of the comments that were made in the previous session by Professor Rogelj around the UK having taken advantage of the lowest-hanging fruit in terms of taking coal-powered fire stations off the grid. Those clear first steps have been taken. I would also echo what Mr Childs and Professor Grubb said about progress to date.

If I can add a governance perspective and look at this from a policy planning angle, when you look at the plan for the first three carbon budgets that we delivered on, we had firm and final policies that were projected to overdeliver for the third carbon budget. We have now met that. If you look at where we were with the last plan, the firm and final policy projections only took us 40% of the way to the sixth carbon budget. That is up to 75% in the new plan.

There is a big point around attention on policy development as well as the point around looking at technology risk that was emphasised in the previous panel.

Q30 **Chair:** Professor Grubb, on that question of technologies, how should the Government strike the right balance between emerging technologies, such as hydrogen and CCUs, and scaling up proven measures that have a lower level of risk and will maybe deliver emissions cuts sooner, such as insulation and EVs? Have they got that balance right?

Professor Grubb: Innovation is always a complicated area because by definition you do not entirely know, but we have learned quite a lot. I am always a little amused when people talk about CCS as an emerging technology. It was emerging when I started in this field in 1990, 35 years ago. If it is emerging, it has been doing so at a rather glacial pace since then.

Yes, there is a step towards finally moving to commercialisation, but almost by definition there are some technologies where you can expect a lot more innovation than others just due to their physical characteristics and the time it takes to invest, scale up and learn.

Have the Government got the right balance? Not entirely, no. One of the big lessons of the last 20 years in energy innovation has been that technologies where you can have relatively rapid deployment and learning cycles are the ones you can expect a lot of improvement. We saw that initially in some of the emergent renewables. It has become astounding in solar and battery technologies. Given the scale of investment, we have managed it very successfully in offshore wind.

One big area where I do not see enough attention is longer-duration storage technologies. We do not have a coherent innovation strategy there. We are hugely underestimating the potential for innovation. We risk putting too much money towards big-ticket expensive items where we do not have a great track record. We will not know for a decade or more whether it is really going to pay off.

Q31 **Chair:** What are those things? Could you point to any examples?

Professor Grubb: I am thinking of some aspects of CCUS and the fact that we have 10 funded hydrogen projects that have as yet no real offtakers wanting to buy. Some are really good. In terms of whether you want 10 in parallel before you have established who wants to buy the hydrogen on what kind of terms and for what kind of uses, that may be premature.

Nuclear is another area of debate. We probably do not want to get into that. We know the British history around the economics of large-scale nuclear. We know the current debates around SMRs. To say it is in the early stages of deployment is an exaggeration. It depends a little bit on what you mean by "deployment". There is one reactor in China so far. That is the lead example of an SMR. There is lots of industrial interest.

I am thinking of those big bets. When I was on the Climate Change Committee, we said, "We need to explore nuclear, CCS and renewables." The implication was that after 10 or 15 years we would have learned something and would not be continuing to do everything at the same time. There is a cost to that. There are benefits as well, but I am not sure we have really thought through the balance.

Q32 **Chair:** If you were to summarise it very simply, the Government may be too focused on emerging technologies and not focused enough on things where they can have a higher degree of certainty. Is that what you are saying?

Professor Grubb: The Government are a bit too focused on too many big-ticket supply technologies and are not paying enough attention to smaller-scale technologies that could be absolutely crucial for the future.

We need forms of storage at different levels in the system. We need smarter technologies, in many ways. As already indicated, we will need a lot of demand-side measures, which are not so simple to deliver in a way but are clearly much more cost-effective. It is just a bit harder for a Minister to sign off on a massive thing.

The imbalance in focus is partly between the degree of supply versus demand, but associated with that, yes, it is about the scale of development. We know there are things that can be done on the demand side that are perfectly well proven and have further potential for innovation but are not being pursued at scale.

Mike Childs: Can I briefly add to that? We definitely see it as technology over-optimism within the Government's climate plan and by the Climate Change Committee. We are fans of the Climate Change Committee, but we are not uncritical. We would have liked them to produce a pathway of technology headwinds as well as the singular pathway that they produced when they provided advice.

Take sustainable aviation fuel. This Committee has looked at sustainable aviation fuel and been sceptical about the growth potential. The Climate Change Committee has been more sceptical on sustainable aviation fuel than the Government are. It would be perhaps more prudent for the Government to row back further on that.

On greenhouse gas removals, we need to get beyond some of the phrases and recognise what we are talking about here. Effectively, we are talking about Drax. That is the very large source of greenhouse gas removals within the plan. That is not written in the plan, but it is clearly what is meant there. Drax is not uncontroversial in terms of the source of its wood pellets, the carbon accounting of the extraction of the wood pellets and the fact that it does not yet have the finance or all the permissions to carry out carbon capture and storage.

There is a massive assumption within the Government's plan that we will get all this greenhouse gas removal, which allow them, conveniently, not to tackle difficult things such as demand management in aviation or investing in buses so that people can get out of their cars and choose low-carbon options. Technology has come to the rescue for the Government, but they are being far too over-optimistic.

Q33 **Chair:** Mr Hunter Jones, I want to return to that question about the balance between emerging technologies and proven measures. What is the best way to sequence the actions required to avoid blockages in areas such as supply chains and skills? Do you have anything to add to what we have heard about the balance that the Government are attempting to strike?

Sam Hunter Jones: I have been nodding along to everything that has been said there in terms of the balance between proven technologies and approaches that have multiple co-benefits.

Stepping back, if you look at the risk here, if you assume there is a finite amount of Government attention and funding to go towards the transition, if you look at the CCC's seventh carbon budget pathway, 80% to 85% of that is delivered through proven technology. There is a real risk that we let subsidies, attention and policy development going towards that 10% to 15% distract from and undermine the delivery of the main part of the challenge.

It is really great to see a funded warm homes plan being committed to recently, but no one thinks that there is not further we could be going on insulating homes, supporting the development of heat pumps,

decarbonising transport and supporting public transport and active travel. That is where we see the balance going wrong. Priority needs to be given much more to the proven 80% that has real co-benefits for health and wellbeing, but also bills.

Q34 **Barry Gardiner:** I want to look at the delivery plan and see how robust it is. If we look at the energy and emissions projections, they are expected to deliver over 100% of the emissions reductions to meet the carbon budgets 4 and 5, but only 75% of the savings needed for carbon budget 6. We have carbon budget 7 on top of that. How realistic are the recommendations made by the CCC for carbon budget 7? We can go down the line very quickly, and you can say, "Yes, 4 and 5 are fine; 6 is problematic;7—whoops." That is fine. Just give us an overall feel of it.

Professor Grubb: I will kick off. I have some sympathy in the sense that almost by definition we cannot nail down precisely everything that could save what in carbon budget 7.

If I were to step back—before this hearing, I was thinking about precisely this question—this is broadly the way that I would frame them. If you work through them, carbon budget 4 largely delivered through the transition in the electricity sector. That has gone a long way and has further to go but will encounter more complications.

Carbon budget 5, similarly, centred on electricity. You can probably deliver the carbon budget, but you certainly need to be thinking about a sensible solution with Scunthorpe and maintaining the progress in some of the other areas.

Carbon budget 6, you need more work across multiple sectors, particularly transport. I find the Government's approach on transport somewhat tepid, given what we know about the technology. I do some work in China. In China, they just do not understand it. Electric vehicles are cheaper to buy; they are cheaper to drive; they are cheaper to maintain. What is the problem? We are creating obstacles in the way of a more rapid electric vehicle transition now, in my view, or at least failing to address the particular challenges in the UK. You could argue the pros and cons of hybrid, but it risks muddying the waters and allowing established industries not to make the transition as soon as they could and need to.

If you then look at carbon budget 7, along with it is going industry and the supply chains for the above technologies. For carbon budget 7, we need to be much more serious about how we tackle heating. Because it is a slow turnover sector and we are building lots of building stock, we need to start now. It is really the blocker on carbon budget 7. There is lots that we could come back to on some of the options in heating. I can come back later with some strategic thoughts.

Mike Childs: We definitely can hit carbon budget 6. As I said, the Government are over-optimistic on some technologies, but they could

pull levers harder in other areas to help achieve that, with more on insulation and on giving your constituents decent bus services so that they do not have to have a car, for example.

On carbon budget 7, they are heading towards a very difficult area. We could definitely deliver it, but I do not think that we can deliver it at the same time as saying, "Yes, we want to give a green light to Heathrow," and there is a challenge going forward. We did a report with the Tyndall Centre for Climate Change Research back when we campaigned around the Climate Change Act. Its report was 200-odd pages, but I will summarise it in a sentence. It said that aviation will eat the carbon budget eventually, unless we really address aviation. We and the aviation industry have been very lax in terms of trying to decarbonise, and we are way behind.

Barry Gardiner: I trust you enjoyed this Committee's report on SAF.

Mike Childs: I did indeed, yes. Could carbon budget 7 be delivered? Yes, but not with Heathrow expansion. We need to do more on heat pumps. There is a grant now for heat pumps, but many households are not going to be able to afford the full cost of a heat pump with just a £7,500 grant. If the Government are taking a fairness approach to this agenda, why are they not saying that, for low-income households, the grant will be bigger? Perhaps some wealthier households do not need quite such a big grant, for example.

The switch to EVs is inevitable, but there needs to be action to try to remove some barriers. Some of those barriers are for people who do not have driveways. Public charging is very expensive at the moment, and we need to see that controlled so that it is fair for people who do not have driveways.

As we talked about following your question, Chair, the focus on insulation has not been there. Yes, let us hope that the warm homes plan is strong when it comes out, but it is not going to be as strong as it could have been if the Government had stuck with their pre-general election campaign promises to invest much more in insulation.

These targets can be met, but they need a willingness across Government to deliver on them, and that includes the Chancellor, who is very keen on Heathrow expansion. It means keeping an eye on areas of growth such as data centres, for example, where there are many proposals. They may be fed by renewables, but that is stealing renewables from other areas, if you like, so we need to keep an eye on things such as data centres. We need a much stronger focus, as I have said, on fairness and bringing the public with us if we are going to deliver on carbon budget 7.

Sam Hunter Jones: Just to dig into that data you mentioned around the energy emissions projections, in case it is helpful to explore what that means in practice, the Government, in their latest plan, make the

distinction between what they call implementation risk, on the one hand, and effectiveness risk. That 75% figure in terms of energy emissions projections shows a lot of progress on implementation risk—how firm the policy is—but it does not say a lot about effectiveness risk. If you have a policy in place for CCS, is it still likely to deliver because of all the technical costs and challenges, et cetera?

We now have more transparency since the litigation recently around publication on assumptions around emission savings, but one thing that the Government have not published as yet with the latest plan are the so-called risk tables that emerged in the previous litigation, which went through, policy by policy, to explore the risks and to set out the proposed mitigation. That would be helpful for parliamentary and public scrutiny to understand what the risks are in terms of technology and reliance on emerging approaches.

Q35 **Barry Gardiner:** Thank you for that. The Climate Change Committee examined 163 of the plans for reducing emissions this summer, did it not? Fewer than half of them were considered to be fully credible, and over a third were considered to be either insufficient or to have significant risks of failure. You very elegantly, I thought, sub-claused them into implementation risk and so on. Can you say what that spread is?

Sam Hunter Jones: Going from that 40% energy emissions figure, which is a firm, final policy with the last plan, to 75% shows a great deal of progress on implementation risk. There is still definitely more to be done. As you said, the first plan over-delivered in terms of firm policy. For us, reading the CCC's advice, and from our own reading of the plans, the effectiveness risk is the really big issue. There could be more transparency around what is in there.

It appears to be from the current plan that we are now in the realm of central assumptions and what the Government believe to be credible scenarios, whereas, in the previous plan, there was lots of reference to theoretical potential and what could conceivably happen. There needs to be more transparency around the concrete, specific risks and what the mitigations and the contingency plans are, which were mentioned in the previous session.

Q36 **Barry Gardiner:** You are referring to the court case that was fought over the credibility of the carbon delivery budget. The Government got their response in two days before the legal deadline, which we were all very pleased about.

Together, you have explored some of the barriers to us meeting our emissions reduction targets and how we need to overcome those, but are you happy to say that we have realistic and credible policies in place to meet, first, carbon budget 6, and, secondly, carbon budget 7—either both or neither, or which one?

Mike Childs: On carbon budget 6, the plan came out only last week, as you will know, and we are going through it in detail. I have a list here of

20 questions that I want to ask the Department for Energy Security and Net Zero.

Q37 **Barry Gardiner:** Only 20?

Mike Childs: Yes, only 20. We want to try to get some more information from the Department. For example, the risk tables were not published. Within the plan, they did not talk about what their passenger number assumptions are for aviation, so it is very difficult to get under the bonnet in that as well.

They have included, as was mentioned in the previous session, a degree of international offsets by using the CORSIA mechanism for international aviation. It is not clear whether they are going to verify those CORSIA emission cuts or just assume that what is written on the packet, if you like, is correct. We have lots of questions before we can really say with confidence that this plan will deliver on carbon budget 6. We do not have the carbon budget 7 plan yet.

What I would say, though, in the Secretary of State's defence, is that the Secretary of State is clearly committed on this and has clearly been working hard to try to convince his colleagues to deliver the policies that they need to deliver. We do see it as a better plan than the previous plans, which we took to court because, in our view, they challenged the whole integrity of the Climate Change Act. They were that bad.

I do not think that we are in the same position yet. I will reserve my judgment until we have got through all the detail and looked at some of those questions. We have seen a step forward, but what it does need is continued political focus on delivery year on year. We need the whole of the Cabinet behind it, including the Chancellor when she makes her autumn Budget speech next week. Then, of course, Parliament will decide what the seventh carbon budget level is, and a plan will need to come forward from that, which will need to be scrutinised as well.

Q38 **Barry Gardiner:** In terms of an implementation timeline, you might just say, "Let us do everything as soon as possible," but there are certain things that we cannot do until we have done other things. How do you see the phasing of it being managed by the Government?

Mike Childs: There is a clear focus on the electricity area at the moment, with the clean energy mission. The 2030 target that the Secretary of State set is very ambitious. Bravo to him for setting such a brave and bold target; let us hope that it is met. The important thing is that we must not distract from the other sectors that absolutely need focus.

Again, for example, if you look at the DEFRA part of the climate plan, it is very strong on methane in terms of saying, "We are going to use feed supplements to reduce methane," but it is not clear at all whether it thinks that there is a need for behaviour change in terms of diet, whether we need to look at livestock numbers, or whether we need to encourage

people to switch, not just from eating meat but to eating different types of meat. There is a whole layer of questions that we need more exploration of, but the danger is a single focus on electricity risks meaning that we do not focus on other areas.

Q39 **Barry Gardiner:** Professor Grubb, what are the implications of the the CCC offering only one pathway in its recommendations on carbon budget 7 rather than the multiple pathways that it previously looked at?

Professor Grubb: I find that interesting. One of the reasons is that it felt that it was a level of ambition that required most levers to be pulled, in which case you could argue that it is hard to generate alternate scenarios. I am not entirely convinced of that. There could remain different ways and different routes. Not surprisingly, it perhaps could not—and it is, arguably, not its full remit—delve into what difficult policy choices or possibly alternates would be required to get on that pathway.

I will flag just a couple of things that we could come back to a little later. One is that electricity is seen as the centrepiece. That is interpreted as electricity decarbonisation, but it also requires electricity to be cheap enough to fulfil the other roles in electrification in ways that are also good for the economy. That will require engaging with some challenges and thorny issues in the energy sector, such as, if the ultimate aim is to help electrify other sectors of the economy, including heating and transport, there is, first of all, a good economic case to balance the policy costs across all of those things, so that you do not distort things against the thing that you are trying most to promote.

There has also not been enough attention on the fact that we are moving rapidly towards a world where we have some renewable energy coming off support contracts, and 5 GW already in 2027. What will happen to those? There has not been enough attention. Could some of the emerging post-contract renewables be made available at a really very healthy cost to some of the most needy sectors? That is a crucial one.

Q40 **Barry Gardiner:** I am conscious of time and I just want to ask you one further thing. From what Mr Childs and you have said already in terms of SAF and in terms of transportation, I wonder if you feel that there is a danger that the CCC is now, instead of offering Government what it sees as the solutions to the scientific facts of climate change that we have, offering the solutions that it thinks the Government are prepared to accept.

Professor Anderson up in Manchester has made some interesting remarks on this, in terms of how it is strange that, instead of advising about modal shift from private vehicles to public transport, the committee has chosen to say that we will sequester—CCUS or otherwise—three times the current global sequestration in order to offset the use of private vehicles. This is something that we have taken up with the chief executive of the Climate Change Committee, and it was clearly denied, but I just wonder whether you share those concerns.

Professor Grubb: The Climate Change Committee is in a difficult position in the sense that it wants to offer advice that it thinks could be implemented. Otherwise, its scenarios are less useful to Government. I cannot really comment on the extent to which it is prejudging any of that. It might point to the fact that the history of behavioural change has been limited. There is a lot of social science around the fact that is very hard and that people have made too much expectation of individual behaviour change, because it is always embedded in a set of infrastructure and social norms, and it is tricky in terms of how far the committee wants to go there.

Mike Childs: I agree with the sentiment behind your question, Mr Gardiner. First, the Climate Change Committee should have produced multiple pathways. There are choices to be made, and those are political choices. Offering one pathway can suggest there is only one route forward, which is not helpful for decision-making. It also enables you to say, "What if this technology does not roll out as quickly? What if there are headwinds? What does that mean we need to do in other places?" Multiple pathways would have been the right thing to do. I do not understand why it did not do multiple pathways. It would be an interesting question to ask them, I am sure.

There were many who were perplexed that the Climate Change Committee decided to withdraw its recommendation of no net expansion of airports. Someday in the future, that may be something that will be possible to say if the technology scales up. We do not have sustainable aviation fuel at any degree yet, as you have identified, and so to give the green light to aviation expansion, when it previously said, "We cannot do that because we do not have the technology," seems to us as though that is playing politics and trying to say what the Government wanted to hear. That is not the role of an advisory committee. It needs to give advice, and it is for Government and Parliament to decide what to do with that advice.

Barry Gardiner: Finally, can I finally apologise to you? There is a debate that is going to be starting in Westminster Hall on the delivery of the carbon budgets, which I intend to speak in, so I will be leaving early from the Committee. Thank you very much for your submissions.

Q41 **Olivia Blake:** Just coming back to the governance arrangements, my first question is to Mr Childs and Mr Hunter Jones, but I am happy if you would like to come in as well, Professor. What governance or system-wide barriers have held back delivery under earlier carbon budgets? How can these be addressed to reduce any delivery risks for the seventh carbon budget?

Mike Childs: In terms of one challenge that we have, I have spoken warmly about the current Secretary of State, and he is working hard across different Departments. To an extent, he is then the vehicle of, "If something is not on track, why is it not on track?" We would like to see other Departments having a much stronger focus on, "Why are you not

cutting your emissions as well?," rather than being able to say, "That is a DESNZ problem." In reality, that means that there needs to be cross-Government ownership by the Prime Minister. If the Prime Minister was to say, "This is my climate plan," and speak to it and launch it, you potentially have much more sense of governance from that perspective.

The role of Select Committees is clearly important. Sitting here, I would not say otherwise. That sense of, "We need to have proper debate about these issues," is incredibly important. Again, referring to a question in one of the earlier sessions, public participation in policy design and deciding how we go forward on climate change is absolutely critical. With the best will in the world, if you have people only within a Westminster bubble deciding what we are going to do, but you have not engaged the public, however well intentioned that is, that is going to run on to the rocks.

We need to see approaches such citizens' juries and citizens' assemblies, and much greater public participation in policymaking, if we are going to move forward. As I have probably said too many times now, we need a laser focus on fairness, because, ultimately, we will fail if we do not bring people with us. That is the biggest governance challenge of all.

Sam Hunter Jones: It builds a bit on the earlier point about the discussion around the CCC and the pathways, which I agreed with and which underscored for me the importance of parliamentary and public scrutiny. The CCC is a highly expert body, but there are going to be differing views around the best approach.

Transparency has ebbed and flowed in implementation of the Act since inception. The transparency that we now have with the plan is a move forward, but we would like to see it go further. It should also not take us going through technical annexes to understand these issues around the different risks that are involved.

These things should ideally be spelt out more clearly and put front and centre in the plan, building on Mr Childs' point around public engagement, so that there is clarity around the pathways and the choices that have been taken. Going back to that point about contingency plans, what is the plan if XYZ technology does not come forward at the pace required under the plan?

Q42 **Olivia Blake:** Clearly, having credible contingency plans is very important. There are mechanisms such as scrutiny, cross-Department oversight and public reporting. I know that we have spoken about public involvement, but what more can we be doing in Parliament and across Departments in Government to ensure that these plans are realistic and effective?

Sam Hunter Jones: The work of this Committee and others is very important in that. Again, it just goes back to the point of transparency, so

that the information that the Government publish allows Parliament, the public and civil society to perform that scrutiny function effectively.

Mike Childs: There are particular risk areas as well where it might be reasonable to say to the Government, "These emerging technologies are clearly a risk area. Please demonstrate your milestones so that we can police them to see whether this is on track." To a degree, the Climate Change Committee will do some of that, but we need it to say, "We are going to come back to this. We are going to keep on it, because this is an area of biggest risk for us," and that will help keep Government on their toes.

Q43 **Olivia Blake:** Professor Grubb, looking back at earlier carbon budgets, what do you feel worked and did not work in holding Government—and regulators, importantly—to account? How can we use any lessons that are there to make sure that the legal duties are fulfilled and delivered to avoid legal challenge as we go forward within that.

Professor Grubb: On that last one, I am not sure that I have easy answers. Broadly, the process has worked in the way that it was designed to, to the extent of advice that is then taken forward by Government, which is then legislated, and for which Government are supposed to then produce the policies to deliver. If not, the committee is empowered to come in and say, "You are not on track. This is what you need to do."

If the Government still fail to take adequate account of that, it is ultimately up to parliamentary scrutiny and the other pressures such as legal challenges. In that sense, it is not the smoothest of journeys, but it is how the system is still broadly functioning, albeit with the need for some legal challenges brought by independence when there is clearly inadequate progress.

If I come back to your question about co-ordination or governance, let us be really clear. We are talking about the transition and upgrading of multiple major sectors in our economy. Governments, necessarily, are split between Departments. You cannot help that. There are always going to be challenges of co-ordination. We have challenges of co-ordination even within the electricity sector. We have NESO. We have Ofgem. We have DESNZ. We have Great British Energy coming. Even Ed Miliband has his hands full with that.

I will give two specific thoughts around this. It is partly around indicators that provide a cross-sectoral view. Those indicators would include, potentially, the balance between electricity and other fuel prices. In terms of household energy bills, whether they are going to go down or up, if we are looking to electrify transport, you cannot say that you do not include transport in household bills today, but you will in five years' time, and then you still expect them to go down. You have to have coherent measures of the costs that are being faced, and Government Departments understanding and owning those cross-sectoral indices.

The other thing that I would mention is that Treasury is central, because a lot of this requires expenditure. You have the fiscal challenges. We all know that. An entity that is also potentially very important is the Bank of England. If you look at how some countries, most obviously China, have vastly accelerated low-carbon investment, it is because the central bank has given low-interest loans for green investment on the grounds that they are capital-intensive and clearly needed acceleration to meet their climate and innovation goals, and others.

At the moment, it is like nobody quite knows where the Bank of England sits in this. Many of its architects would turn in their grave at the idea that it should think of some sectors that have lower-interest loans, but that is what we did in the financial crisis in terms of digging ourselves out of it.

This is, ultimately, a macroeconomic challenge that the country is facing. Let us be clear. That can sound scary or it can sound like an opportunity. If you look at it from the Bank of England's standpoint, interest rates are to control inflation, but higher interest rates drive up the cost of the energy sector, which is one of the sources of inflation. A little bit more structural thinking about the way that money is injected into our society in relation to the scale of the low-carbon transition and the economic opportunities associated with it is called for.

Q44 **Olivia Blake:** That is exceedingly helpful. Just winding back, ownership has come out of all of your answers there. Are there any suggestions that we should be making in our report about how to build ownership across Government Departments, the Bank of England and the rest of it? How do we make sure that there is a continued collective endeavour in this going forward, if that makes sense?

Professor Grubb: Others around this room would probably have a better sense of Government machinery for co-ordination than I do.

Mike Childs: Transport is the largest sector in terms of emissions, so we need to have it firmly in the spotlight, because that transition goes through electric vehicles. It should be with much better bus services and much better active travel alongside that. Getting them on the focus and saying, "No, we are really going to hold you to account," is something that this Committee and others can really usefully do.

There is a beauty in that. If we properly transform our transportation system so that it is low carbon and we are giving people much better options for buses, walking and cycling, we are helping people who do not have cars get to work. We are helping people access services. We are helping people access social networks.

Again, a point came up in the previous session. The pathway to deliver our carbon reductions has so many co-benefits associated with it as well. The Department of Health probably has its hands full in terms of trying to make sure that the NHS is as strong as possible, but that whole public

health aspect of, "We want a climate plan that really enables and encourages active travel," is something that the Department of Health should be banging the drum for as well.

Sarah Gibson: Following on very nicely from your point, Mr Childs, I want to talk about the social, behavioural and public engagement factors that lead into this. As you mentioned, we talked in our previous session to a certain extent about how we ensure fairness is embodied into it, as well as other beneficial things such as active travel. I am from Bristol, where we have had electric buses since 1895. We do not have them anymore, but we did have them. They were the first electric buses in the country.

Julia Buckley: In Bristol?

Sarah Gibson: In Bristol.

Julia Buckley: Do you have them again now?

Sarah Gibson: We do. It was the Bristol Tramways Company. Just looking back at carbon budgets 4 and 6, what lessons can we draw about how households and businesses respond to policies aimed at cutting emissions? What kinds of approaches work to encourage low-carbon technology uptake? Where has the public engagement been weaker?

Mike Childs: Delivery to date has not really involved the public to a large extent. It has been out there. It has been building wind farms in the North Sea, and switching from coal to gas, and now, one would hope, to renewables. There has not been massive public engagement. There has been mass public support because the public, rightfully, look out the window and see that the climate is changing. They see floods within their communities, and hurricanes sweeping across the Caribbean.

People are engaged in climate change and want to do something about it, but there has not been a massive focus on helping individuals engage within this journey, largely because things such as active travel, for example, have been neglected. I live in York, which is meant to be one of the best cities for cycling, but our cycling infrastructure is dreadful compared to Copenhagen, for example, or the Netherlands.

The public have not been massively engaged. Some are coming on board now with, for example, heat pumps, but we talked earlier about the barriers to that. For most people, it is a massive cost barrier, and some parts of the media are engaged in misinformation on some of those technologies as well.

We have seen positive signs in terms of people drinking more alternative milks rather than dairy milk, for example, or eating a bit less meat, eating healthier, and perhaps eating alternative meats, but those have largely been driven by health reasons. That is not a problem, because there are massive health benefits from those diets. Again, it is about looking at those co-benefits.

If we need to engage people in the problem, we need to engage them in a way that properly engages them in both the problem and the solutions, which is where you come back to ideas such as citizens' panels and citizens' assemblies. Proper public participation in decision-making can then help people think, "I can see how I can contribute to this now."

Q45 **Sarah Gibson:** Professor Grubb, what can Government and industry do to support these households and businesses in adopting low-carbon technologies? We have talked about heat pumps and EV, but you are absolutely right in terms of the active travel side of it. I represent a constituency where the biggest form of deprivation is, in fact, access to higher education, which is 99% due to a lack of public transport to get people to and from those institutions and such. That leads to low levels of education and employment, and appalling levels of car use. What mix of incentives around local engagement and national campaigns would most likely work for those types of issues that we have just mentioned?

Professor Grubb: Maybe I will cover two of them. I am not an in-depth expert on transport and urban transport.

Sarah Gibson: It is rural transport that I am worried about.

Professor Grubb: It has been very clear to many people for a long time that trying to privatise public transport, which brings many other benefits, and then expect it to thrive at just straightforward market rates is not going to work at the scale that is needed. It is a classic example of where there is a case for various forms of public support for public transport—both the infrastructure and the operation.

That has also been one of the significant places for scaling up electric vehicles—electric buses and electric tramways, et cetera. That has largely been a matter of trying to socialise, more widely across the country, successes in particular towns, presumably, including Bristol and others. The way in which that gets paid for is really important, and budgeting for local authorities should take that into account. As I say, I am not an expert in that area.

Let me, though, mention one other area. We keep coming back to energy efficiency and the UK's lousy building stock, et cetera. We had significant successes up until about 2011 or 2012. Along with the huge success of the electricity market reform of the coalition Government, there was the spectacular failure of the green deal. It was a classic example of, "Let us assume that we have 55 million-plus individuals all sitting down and rationally calculating their long-discounted cash flow analysis and whether they want to take out a 20-year loan." It was nonsense. People do not behave that way. That was the big lesson.

Engaging with people in the way that they behave in their households is the starting point. We have, over time—and other countries may have even better examples—found things that do work. It is just that they have frequently been abandoned, either because of central cost or

because of ideology and the belief that, "If you just give a bit of a long-term loan incentive, people will all sit down and do the economically rational thing." That is not how energy efficiency works. I do not know about you, but I do not wake up every morning and think, "How am I going to optimise my energy use today?"

Sarah Gibson: I am one of those geeks who measures my energy use every 15 minutes, but I know that I am strange.

Mike Childs: Because it is about the climate plan and about carbon budget 7, we are talking about the role of national Government, but local government and regional mayoral areas have a key role. We have seen how, in Manchester, Andy Burnham has moved forward with franchising the buses. The Bee Network is now operating well, rolling out and getting more people on board. They have had a very strong focus on active travel as well.

Within the climate plan, the role of local and mayoral areas is largely neglected. Again, perhaps it is about, "Everything gets fixed in Westminster," but we can see, particularly on this engagement around behavioural change issues, a really important role for local government and mayoral areas. They are also cash-strapped and challenged at the moment, but there is some ambition there that is worth applauding.

Sam Hunter Jones: I was just going to emphasise the same point and say that the climate plan currently assumes a lot of action at local authority level in policy mapping and emission savings, but the question is whether they are being properly funded to deliver on those assumptions. That is the question, because you see lots of leadership at local authority level—"I have been doing work on the local planning system and encouraging better spatial planning around public transport and buildings"—but the question is whether the resourcing there.

Mike Childs: We also see some councils now saying, "We are not going to do climate change," shockingly, including areas that are very prone to flooding, so try to make sense of that. Many councils, the Local Government Association included, are saying, "What we could really usefully do with is a statutory duty to deliver on climate change." We have the devolution Bill working its way through Parliament. There is a perfect opportunity to say, "Let's give local councils a statutory duty to deliver on climate change, and nature recovery as well." They are calling for it. It helps them deliver what they need to do, and it gives us greater certainty on delivering on the carbon budgets as well."

Q46 **Sarah Gibson:** That brings me to the very last part of the question. Of the structural barriers that were perhaps underestimated in delivering carbon budgets 4 to 6 and that need to be tackled in carbon budget 7, how should these barriers influence the policy design in the interventions?

Mike Childs: A lot has been said in this and in previous sessions about delivering on climate change being a collegiate activity. It needs to have all parts and all layers of Government actively engaged in that. Perhaps there is scope to bring those together more frequently to focus on climate change. When the new Government took power, the Prime Minister said that he was going to bring together the regional mayors and have more discussions. I do not know how often they happen or how frequently they talk about delivery on climate change, but it is those kinds of mechanisms that say that this is a collective endeavour. If we do it well, it will significantly improve the economy. It will significantly improve people's lives. We will have cleaner air and warmer homes—all those things that we know, but it has to be a collective endeavour.

Q47 **Chris Hinchliff:** All of you have addressed some of these points already, so do not feel that you need to reiterate points that you have already made. One of the crucial questions that I wanted to ask particularly Mr Childs and Professor Grubb is, when planning for carbon budget 7, how can the Government build in resilience to things such energy price spikes, inflation and global instability, so that we can make sure that households and businesses are protected as we go on that journey to net zero?

Professor Grubb: There is one obvious observation, which is that the major impact on households over the last decade and more has been the energy price crisis. Fossil fuel markets have always been volatile. We have had three major crises in the last 50 years. They are always followed by a period of falling prices. People then get lazy, we get more fossil fuels, industry invests less because it is less profitable, and you then just build up the pressures for the next crisis.

One under-remarked thing is that there is a tendency for the environmental and renewables community to insist that fossil fuels are going to get more expensive. The paradox is that the more successful we are on climate policy, the cheaper fossil fuels will get, because we are using less of them, so we are putting less pressure on global resources and all that goes along with that.

One way to make ourselves more resilient is, indeed, to become less dependent upon the vagaries of fossil fuel markets. We have to be very careful, if we are over-dependent on wind and do not have enough storage of the right kinds, that we are protected against the Dunkelflaute, or low wind periods, but there are many ways of addressing that.

A really important topic, where I do not think we have a unified answer among any constituency, is whether a predominantly purely electrified system is sufficiently resilient, or whether there is still an important role for what I would say are molecules in the energy system more broadly, which, over time, would progress probably from methane towards hydrogen. What does that imply for the infrastructure? Can we repurpose the gas grids as the volume of natural gas goes down? Those are really important questions around resilience, and I do not see any clear consensus answer yet.

Q48 **Chris Hinchliff:** Just before I come to you, Mr Childs, I want to build on that a bit. I take everything that Professor Grubb said, but we are currently going through the aftermath of a major electricity price spike, which has come dangerously close to blowing us off course politically in terms of dealing with the climate emergency. We are pushing ahead with renewable energy, but that has not insulated us from that problem now. Going beyond just, "We know that renewables are the way out of this, and let's push for it," is there something more that we need to do?

Professor Grubb: If I could make a quick point on that, we have an electricity system where the market is designed around gas as the marginal fuel setting the price. That remains a problem, if it is that dependent on the thing we are trying to phase out and we do not have very clear answers as to how that structure of market will work when gas is not setting the price. Does the price keep collapsing? If so, you still have to fund the capital.

One of the things we have to look at more seriously is why consumers cannot access renewable energy at cost. At the moment, they cannot. Even if you are on a green tariff, you are, in general, paying the cost of gas, potentially plus a green certificate. That is just not a sustainable structure for the long term. We have more renewables coming, with periods of surplus. We have some coming off contract. We still do not have a market structure that enables people to access that electricity on a cost-plus basis.

Mike Childs: I agree with everything that Professor Grubb said there. I mentioned earlier the importance of taking off-policy costs and off-energy costs as part of the equation. This may strike you as a bit old-fashioned, but the root cause of the challenge behind a lot of this is the economic inequality that we have across the country. We have so many people living on the breadline that any rise in cost, for any reason, tips you over the edge. If the narrative is, "This is because of net zero," of course you are going to get a backlash against that.

If you try to use economic signals to change behaviour—for example, "We are going to put fuel duty prices up because we want you to drive less"—but, at the same time, your bus service has been slashed by 50% over the last 10 years, all that that seems is punishment for people on the lowest incomes across the country. While we absolutely need to address the environmental challenges around how we address this, we absolutely need to address economic inequalities as well.

Resilience builds beyond just carbon mitigation. It is also about adaptation. How do we help those people who have the least income to have resilience against flooding or extreme heat? Those are realities that we are facing now and will face more of. The resilience question is an absolutely brilliant question. It is exactly at the heart of the matter, where we need to look at how we make this transition in a way that enables people and society to come along with us on this journey and make sure that resilience is delivered.

Q49 **Chris Hinchliff:** To follow up on those points, you have already referred today to this being a macroeconomic problem, essentially. You have briefly addressed the point of monetary policy. With a one-line answer, is monetary policy and a more proactive approach on that important to building in that macroeconomic resilience for the country as we go on this journey?

Professor Grubb: It could be. I do not want to be more definitive than that yet. At the moment, it is not being seriously considered in the policy circles.

Mike Childs: I said earlier that the Department for Transport has opted out or gone rogue on climate for a very long time. The Treasury does not hold climate action as close to its heart as it should do across all its policy areas, and it would be a big step forward if it did.

Q50 **Carla Denyer:** We have talked about electricity prices a lot. I would love to get the panel's opinion on a few specific proposals, if you have seen them and had a chance to look at them. The first question is probably especially for Professor Grubb, given your experience in electricity market reform. Given gas's role in setting the electricity price, there have been a number of proposed approaches to decouple those, including Greenpeace's and Stonehaven's suggestion to move gas plants into a strategic reserve, and your own green power pool proposal from 2022. Do you still think that decoupling is important? Do you have a view on what way of doing it is best?

Professor Grubb: Decoupling is important, or you might say parallel market structures. It is not just, "If gas was expensive, how could people get cheaper electricity?" It is more strategic than that. It is, "We have inherited a market design that is based around commodity trading prices." We are moving to an asset-based system but expecting it to be funded on commodity. Then that does not work, so we have a lot of Government long-term contracts and more and more direct Government supports for things that, in effect, are not funded through the market. Those issues are important.

Regarding Stonehaven, I have seen it, and I am curious, because if you just take gas out of the market, you have a problem about what fills the gap when you do not have enough renewables, so it is not clear to me what it is proposing. Initially, it is not that you would reduce prices. You could drive them up in the wholesale market if you are getting a really high price, and then you release the strategic reserve.

There is merit in a strategic reserve, but it has to be phased in, and its main purpose would be to stop broadly oldish plants that are subsidised through the capacity mechanism, undercutting the incentives for storage, which may be a much better longer-term solution.

On the green power pool or related proposals for whether you can bundle up renewables and make them available directly to consumers, there

absolutely is mileage to look at that more. I am not saying that it is an easy fix. If it was, we would see more of it, but it is far too important to ignore just because it is complicated as to how you disentangle effectively those two very different types of electricity.

Q51 **Carla Denyer:** The second part of my question is a similar one about a different proposed solution. Some are proposing differential energy tariffs—social tariffs, or an essential energy guarantee, as the New Economics Foundation calls it—to target energy cost support towards lower-income households. It seems to me that there are quite some practical challenges with that, because the data that energy companies and the Government currently hold does not reliably tell you how many people live in a house, and you would have to adjust the allowance of low-cost energy for that. I would be really interested in the panel's view on whether those kinds of ideas have legs.

Mike Childs: We have been promoting, as have many fuel poverty groups, the idea of a social tariff. It is not easy. It will not be perfect, but I do not think that we should let that get in the way of trying to introduce it. Otherwise, we are, in effect, leaving many people in the poorest households facing unaffordable energy bills. While one would hope that we transition to a fairer, more equal world with fewer economic inequalities, these measures such as social tariffs are important measures as a stepping stone towards reducing those inequalities.

Q52 **Carla Denyer:** I am worried about potential unintended consequences on large families, for example. Is that overcomeable?

Mike Childs: Nothing is perfectly overcomeable. You may need to look at measures around it to deal with unintended consequences, but I do not think that they are insurmountable.

Professor Grubb: We did a little bit on that. The only social tariffs that seem credible to me are ones that combine Treasury knowledge of welfare with supplier knowledge of energy use. If you are not willing to cross that bridge, I do not see it working.

Chair: Professor Grubb, Mr Childs and Mr Hunter Jones, thank you very much indeed for providing that excellent evidence to us. We now have a Division, and we will bring this session to a close.