HOUSE OF LORDS

Industry and Regulators Committee

Corrected oral evidence: Ofgem and net zero

Tuesday 9 November 2021

10.30 am

Watch the meeting

Members present: Lord Hollick (The Chair); Lord Allen of Kensington; Baroness Bowles of Berkhamsted; Lord Burns; Lord Curry of Kirkharle; Baroness Donaghy; Lord Eatwell; Lord Grade of Yarmouth; Lord Reay; Lord Sharkey.

Evidence Session No. 14 Heard in Public Questions 141 - 153

Witnesses

I: Josh Buckland, Partner, Flint Global; Tim Lord, Senior Fellow (Net Zero), Tony Blair Institute for Global Change.

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Examination of witnesses

Josh Buckland and Tim Lord.

Q141 **The Chair:** Good morning. Welcome to the 16th meeting of the Industry and Regulators Committee inquiry into the transition to net zero and the role of Ofgem. I welcome our witnesses in the first panel, Tim Lord, who now works for the Tony Blair Institute after working for two decades in the field that we are exploring, and Josh Buckland from Flint Global. I remind you that this is being broadcast and there will be a transcript available for you to review in due course. You have in front of you the declaration of interests from members of the committee, so you have an idea of who we are and where we are coming from.

One of the great challenges that we have been discussing over the last few months is how the Government can promote investment in the journey of transition to net zero. Many witnesses, including industry investors and observers, have been concerned about the lack of clarity of the rules. The Government's recent publication of 1,800 pages included a very powerful case that the investment they will make will encourage £90 billion of investment from other parties. The witnesses that we have heard since that was published have been probably less than convinced that that is enough. Tim, you might like to start us off. Do you think there is sufficient clarity and, if not, what do the Government need to do to stimulate that investment from existing industry players and new financial investors?

Tim Lord: Thank you, and it is a pleasure to be appearing before the committee today. I think that there is a lot more clarity than there was. When we look at when the net zero target was set—that is an economy-wide target for 2050—we have seen in the last 12 to 24 months, and particularly in the last month, the Government translating that into a clearer set of targets on a sectoral basis, for example by saying that they want to achieve a zero carbon power sector by 2035. Secondly, there has been a lot of success in driving investment in the power sector over the last decade. When we look at the impact of the contract for difference, the fact that over half of our electricity supplied now is from low-carbon sources, and the growth of offshore wind and so on, there has been real success in driving investment.

The challenge ahead is that the next phase of the transition is not just quantitatively different in the volume of capacity that we need to build, but qualitatively different. I think Greg Jackson talked about the fact that the technologies that we need have a fundamentally different set of characteristics to the technologies that have got us to this point in the electricity transition. That means that we need a much more fundamental redesign of our market frameworks. When we look back over the last 30 years since privatisation, the market fundamentals have not shifted all that much. When we introduced the contract for difference, it was layered on top of the existing electricity market but did not tackle some of the fundamental underlying issues with the design of the electricity market in a decarbonisation context.

For me, the key challenge in driving investment is looking at the fundamentals of the market on the generation side, on transmission and distribution, and on retail and the role of the consumer in this transition. Until we do that, I think we will potentially struggle to deliver the scale of investment we need over not just the next 30 years but the next decade.

Josh Buckland: Thank you very much, and it is a pleasure to appear before you all. I spent a long time in government as well, maybe not quite as long as Tim but a relatively long time. The one ask that business always had of government was, "Give us clarity and then we will be able to invest". I agree with Tim that a lot of clarity has come through in the last year. We are a long way further ahead than we were. There is a set of targets and an overarching strategy at an economy-wide level, but also on a sectoral level.

In reality, the more difficult challenge regarding clarity is how you mobilise the investment that sits within those targets. Ultimately, a target is one thing but a delivery mechanism from government to make that achievable is a very different thing. We are starting to see that development in the near term. A good example is carbon capture and storage, where we are starting to see investment frameworks created. The real challenge for government post COP 26 is to create the investment mechanisms that allow the mobilisation of investment into and delivery of those targets. That level of granular detail is not quite there yet. It is starting to develop but in truth, that is the real challenge that then shapes the investment climate and will unlock significant amounts of investment. Government have acknowledged that but in reality, have not quite got there yet.

The point that Tim made on net zero is very important, which is the scope and scale of investment. There are success stories—the offshore wind sector is a great example of that—but the scale of the challenge and the cost implies that you need to unlock new sources of capital. That means looking at different forms of investment—for example pension funds, long-term investment—to try to unlock greater levels of overall investment, but also reducing the overarching cost to the consumer. That is where government have started to think about regulated financing models, for example, and that is where the role of economic regulation becomes even more important. Thought will need to be given to the demands of that side of the investment community, which is very different from the current investment that is typically in the sector, at least at a construction level, and that will need to change fundamentally moving forward.

I come back to the point made at the beginning. I think the overarching clarity and target set is there; it is the next level down of granularity that will mobilise investment.

The Chair: It is the incentives and the framework for investment that need to be clarified.

Josh Buckland: Exactly.

The Chair: It is unsurprising that the private sector investors are basically saying, "We want to see the colour of your money, or the colour of your incentives" in order to negotiate for a decent return, but somebody has to make the first move. The Government appear to be very reluctant to use borrowing for something that is a 30 or 40-year investment to pay back. Do you think that is a sustainable position?

Josh Buckland: I think the scale of the net zero target and the level of investment that is needed implies that you probably need to use every lever. I do not think you can rely simply on regulated payments to drive the level of investment that is required through the incentive structure. The vast majority of that will clearly have to be private investment but there is definitely a role for the taxpayer to fund some areas of investment. It is for the Treasury to think about whether that is through borrowing or other forms of intervention like carbon taxation, in the context of wider fiscal policy, but clearly, there is a role for the public sector in areas where there are clear market failures. Potentially, that can be early-stage technology development cycles, and there is a lot of innovation capital going in now. It can also be in ownership structures that we are starting to see develop. There have been some very recent announcements on nuclear that show that the Government are potentially willing to go down the route of direct investment.

For me, it is thinking about every lever, not just one, but there absolutely is a role for taxpayer investment.

Q142 **Lord Eatwell:** I want to probe your proposition that there has to be a major role for the private sector and reform of the structure of the market, which is defined as not clarity but clarity of incentives. Markets are typically very bad at handling major transitions. There is usually either under-supply or excess supply. If you think of the growth of the railroads and of electricity, there was huge waste. I am puzzled as to why you think that in this case, the market mechanism, suitably manipulated, is going to be so efficient when major transitions have been so inefficient in the past.

Josh Buckland: That is a very good challenge. You can look at areas where the market has operated well, and Tim mentioned the offshore wind sector. An overarching financial mechanism that drives investment because it gives certainty on overall returns, subject to companies getting their commercials right, gives at least a sense that you can drive investment in the right way, and costs come down as a result. Similarly, on the network side the current regulatory framework has clearly had its challenges but has unlocked significant investment over a long time.

The question of efficiency and excess is absolutely the sensible one to address, and that is where the challenge with regulating those structures comes in, but that has mobilised investment where necessary. The real challenge is how you do that in a way that ensures that you can keep up with the pace of the transition to net zero. A reliance on just the public funding package is not necessarily going to provide the level of innovation and pace of change that you require. A sensibly structured regulated model can do that, but it is not right everywhere, let us be clear. For example, the retail energy market side, where you need constant innovation and tech platforms to come through—we are starting to see that happening now—is an area where you do not necessarily want heavy regulation. That balance needs to be struck, given the different challenges in different sectors.

Tim Lord: I absolutely agree with you that markets are not simply going to deliver this on their own. We need to do the net zero transition in 30 years for the economy, and 15 years for the power sector. I think the challenge is how you get government defining outcomes and direction of travel, providing funding and other support, in particular for innovative technologies that are going to have a major role, and enabling the business models that can deliver them at lowest cost, using government's role in collaboration with, and complementing that of, the private sector. If we take the example of offshore wind, government has put in place a lot of measures to bring forward offshore wind, but they have used competitive structures to deliver that through auction processes, for example. That is one example of how you can have government setting a clear direction of travel and then using hopefully competitive forces to help bring the costs of the technologies down.

Lord Eatwell: You referred to the need for fundamental underlying market reform. Can you say exactly what you mean by that?

Tim Lord: The electricity market on the generation side is structured around fossil fuel technologies, for the entirely understandable reason that when the market was liberalised, those were the main technologies on the system. Those technologies have a particular set of characteristics in that they have relatively low capital costs for construction, relatively high running costs, a natural hedge in the market in that the electricity price tracks the gas price, and they are dispatchable and therefore can be flexed to meet demand. The technologies that we will need for the next phase of the transition in some ways have the opposite set of characteristics. They are relatively high in capital cost, relatively low in running cost and are not dispatchable. The idea that the market that was structured around the first set of technologies will efficiently deliver the second set of technologies does not seem terribly plausible. I think there is a big issue around the generation market in particular.

The second point is that we tend to have seen electricity markets as generation, distribution and transmission, and consumers. Consumers are essentially unresponsive recipients of electricity and gas, whose demand is inflexible. The reality is that as we move into the next phase of the transition, you are going to see those three elements of the system having to come together in very different ways. I am afraid I have not managed yet to come up with a design for what that should look like, but Ofgem and the Government in particular have to lead that process of fundamental reform. It has to happen quite quickly because these things take a long time, and while they sometimes take a bit too long, you cannot achieve them overnight. It seems to me implausible that we will be sitting here in 2035 looking back and thinking, "I am glad we did not undertake fundamental market reform back in 2021, when we knew the scale of the challenge and we knew that the technologies to deliver it were going to be very different".

Q143 **The Chair:** Tim, you wrote recently that the required private investment will not happen unless the Government bring forward investable business models with supported market frameworks, as we have just been talking about, which incentivise a rapid shift of money away from high-carbon assets and towards net zero. Is not one of the dilemmas here that investors in high-carbon assets have done extraordinarily well over the last three to five years? Given the requirement for high-carbon assets going forward—and the IEA suggested that the demand may be pretty much the same in 2050 as it is now—would you not continue to make your investments in high-carbon assets unless there is a very attractive alternative? That is the challenge facing the Government.

Tim Lord: I think if you are an investor looking at high-carbon assets, you can see what is happening in Glasgow this week and what the direction of travel looks like. That would make me quite cautious if I were thinking about investing in high-carbon assets, but the fundamental point I am making is that when we look at the net zero transition overall, not just in the energy sector or the power sector, we can be reasonably clear on the technologies that we need to invest in as a country to deliver that. For one of those technologies, renewable power, we have a strong investable instrument to build and we have seen the results of that in deployment and cost reduction. When we look at the other technologies—hydrogen plant, carbon capture and storage, heat pumps on a domestic level—the incentives are not there to get capital flowing into those sectors at the moment.

The fundamental point is that you have to design investable instruments to enable investment to flow, and you also need ultimately to disincentivise or change the incentives around high-carbon infrastructure. The risk is that if you disincentivise the high-carbon stuff without putting in place enough incentives for the low-carbon stuff, you will have a big problem on your hands. That is why we have to move quickly.

Q144 **Baroness Donaghy:** Good morning. Do you see enough co-ordination within the public sector on net zero policies and, if not, what do you think should be done? Catherine Mitchell from Exeter thought that there should be an energy transformation commission and Chris Stark from the Climate Change Committee said that there was a missing layer of government. Dieter Helm said that there were already too many institutions and the National Grid's Claire Dykta said at our last meeting that there was no one silver bullet. What do you think should be done? Is there a need for a co-ordinating body for net zero policies and, if so, what form should this body take?

Josh Buckland: I differentiate between the need for greater co-ordination and the need for a co-ordinating body. I think that is the important distinction. Co-ordination within government, across departmental boundaries, is always a challenge but it is better than it was. Committees have been set up and there is a better level of co-ordination; the net zero strategy is evidence of that. In my experience in government, there was good co-ordination between individual organisations—there is a very close and symbiotic relationship between BEIS and Ofgem. The challenge is when you are trying to co-ordinate multiple decision-makers within a system, and that is where the current framework does not bear itself well in the net zero context. To take a practical example, you will need a huge amount of infrastructure built out into the North Sea to deliver offshore wind connections. At the moment you have the National Grid, the system operator and an Ofgem regulatory model that play roles, as well as the government decision-making structure, the subsidy framework. You also have other bodies—for example, the Crown Estate—and the current issue is that these bodies are not necessarily co-ordinating as a whole set in a coherent way.

The challenge in net zero is how you can make those bodies better co-ordinate across different organisations and institutions, and that means some level of governance reform. I tend to take the view that another body will not necessarily do that. The risk is that if you create a new body, you create a risk of just another entity to co-ordinate, but you do need to look at the potential opportunities. No doubt we will come to the system operator reform and the future of the system operator proposals. If that can be done well, it is an organisation that could do the co-ordinating role, pulling in others within the context of what is needed from a net zero investment and strategic plan perspective. It will obviously need others to co-ordinate with it to deliver the level of investment required, whether that is Ofgem or government. That co-ordinating role potentially can be stronger within the system operator, assuming that the roles and responsibilities are clear.

There is a fundamental challenge, at least in my mind. Government will always have to take a first and front-and-centre role in trying to co-ordinate what is overarchingly needed from a net zero perspective, and subject to political requirements. You cannot just think about the organisations; you also have to think about the links between them, and those are set by government. What are government doing to set a clear strategic policy statement for Ofgem, for the system operator, assuming it becomes independent? In addition, how are they structuring roles and responsibilities across those organisations that means they co-ordinate directly?

It is not an easy challenge. My view is that the co-ordination is not there yet—it is improving—but it does not necessarily mean you need a new co-ordinating body at this stage.

Tim Lord: I worked in government on these issues for many years, and climate policy and net zero policy is very easy until you hit two things. One is trade-offs and the other is systems transformation. The problem is that you hit trade-offs and systems transformation very quickly, so it all becomes rather difficult. I think that we are a lot better at co-ordination across government than we used to be, and the introduction of new Cabinet committees and so on and the Prime Minister's personal push on this agenda have been helpful, but I tend to think that the challenge there is not necessarily one of structure so much as clear political direction and prioritisation. I do not think you should be trying to say that net zero is the problem of one department or one agency, because then it ceases to be everyone else's problem. This is about fundamental systems and economic transformation.

On the energy market, I will not add too much to what Josh said other than that the key thing is to figure out what you want your market to look like and what outcomes you want it to deliver, and then look at the functions that need to be fulfilled to deliver that. I worry about the sort of proposal whereby we need a new body, without first having clarity about what the gaps in the system are and how we fill them. Essentially, form should follow function rather than the other way round.

Q145 **Baroness Donaghy:** You have already referred to the future system operator. Is it appropriate, if there is that clarity that you have both called for? How might such a body interact with Ofgem as well as being led by government policy?

Josh Buckland: I think it is vital. If you look at a system that needs to drive significant transformational change across various markets as well as geographies, an independent system operator that allows and has a requirement to plan the system and deliver it with others makes perfect sense. The current situation is a bit odd and, connected to a point Tim made earlier, now is the time to make those sorts of reforms. We have a 30-year programme to reach net zero and we need to get on with it. I think it is right, but the idea is easier to think through than the actual delivery.

The critical thing is the roles and responsibilities of the new institution: what is its reporting line into government, as well as Parliament, no doubt; how does it operate to ensure that it can understand the political trade-offs that government is having to make and then operate, support and deliver them? Government has a role in setting and giving guidance on political trade-offs around short-term investment versus long-term need.

The other important thing is to what extent it is a delivery body. It could be a very important strategic planning body and it will have a role in the day-to-day running of the system, but it can think about what the system needs are, take input from other sources and think about what is required over time. The question for me is: does it do the delivery of those? Does it run competitions for new network assets? Does it think about how it would regulate different bits of the system? That is where the interaction with Ofgem becomes more complex. It is absolutely critical that government gives clarity as to which responsibility sits where. To my mind, you would probably have a system operator that does an element of competitive tendering to ensure delivery, but the regulation of the assets would fall to Ofgem. That is a slightly complex mix, and you need to think through whether that is the right approach.

That is what government seems to be moving towards but, as Tim said, it is absolutely vital that those roles and responsibilities are clear both in the organisations and between them; otherwise, it will not deliver the level of impact that they are hoping for.

Tim Lord: I will not add a lot to what Josh has said. I think an ISO is absolutely the right thing to do. The point about clarity of roles and responsibilities is critical, but the other thing is that the interface with government policy is so important here. Let us say that we do not reform the market and we just carry on allocating CfDs to renewables. The incentive the CfD creates, intentionally, is that you just generate as much power as you can and put it on to the system, and then the system operator has to figure out what to do with it. That is just about manageable at the moment, when you have roughly 10% of generation on CfDs. In 15 years' time you might have 95% of generation on CfDs and that will create a very different set of challenges for a system operator, which is why in my view we need to look at how we can reform that system. The key thing is the clarity of roles and responsibilities, but also making sure we have the right structures for looking at how government policy interacts with the actual operation of the system, not just now but in the next five, 10, 15 years.

Q146 **Lord Grade of Yarmouth:** Whichever way you cut it, the road to net zero is not going to be pain free for consumers or taxpayers, or both. Ofgem is essentially there to protect consumer interests post privatisation. If you give Ofgem a clear remit that includes effecting net zero, is that a manageable conflict for Ofgem? If it is not, is that a clear role for the new FSO? How do you see that playing out?

Josh Buckland: If you talk to those in Ofgem, they will tell you that they are battling that dynamic already. They have a decarbonisation mandate to an extent, because they have a concern around the long-term future for consumers. They are already starting to get into these real-life trade-offs of investment now versus investment in the future. That has come up through the price control process as well as other areas. They are confronting that issue now and I think they are starting to think about it in a slightly more strategic way, but clearly it is a difficult one. There is value in giving Ofgem a mandate that includes a net zero target. There would be no reason not to, in the sense that it will allow them to think about those trade-offs, but it does not necessarily make those trade-offs any easier. You still have to balance near-term investment versus long-term, and also think about the wider security perspective.

This comes back to the role of government in giving Ofgem a clear mandate and set of responsibilities. Those are political trade-offs, and that is where the Government have a role in setting how Ofgem should approach those trade-offs—not necessarily in individual regulatory decisions, because ultimately they should be made independently, but in the framework that they are trying to create and through the mechanisms they are developing. That stronger, clearer political steer would be valuable.

On the interaction between the FSO and Ofgem, I do not see a world in which you cannot have both bodies acknowledging a need to consider the implications of their decisions for a net zero target. It would seem odd if a strategic planning authority did not have that, but it would also be weird if the regulatory framework did not at least acknowledge that a balance needs to be struck. It makes sense for both bodies to have that. Their role within it will be different. You would assume that the FSO would have a responsibility for setting the overall needs of the system, given the net zero target as a boundary constraint. You would then assume that Ofgem would be thinking about how it can best use its existing mechanisms and any new mechanisms it is given to drive investment, to acknowledge that need and also to consider what the net zero requirements would be. For me, you need to think about both but the interaction between the two needs to be clear and delineated; otherwise, you risk a bit of a clash, which clearly will be a problem moving forward, given the pace of change that is needed.

Tim Lord: I would add three things.

First, while there are trade-offs and challenges for current and future consumers, there are also some areas in which this is really complementary. Consumers, by buying electric vehicles, potentially are adding huge value to the system and to their own energy use, and we need to make sure that the system is designed to support that.

The second point is that in this context, people often talk about de-politicisation of energy and so on. I understand that, but I remember talking to a Minister about depoliticising security of supply and he said, "Let's see how depoliticised it is when the lights go out and we watch where the camera crews go, because they will be turning up at 1 Victoria Street to talk to me". I think we need to be cautious about the extent to which we can depoliticise some of these decisions.

The third thing is that this has to be about dialogue between government and Ofgem. Government has to set quite a clear steer and support Ofgem in making some of the decisions it has to make, because they are fundamentally political. I always worry about the argument that we need to give Ofgem a net zero duty and let them get on with it, because these trade-offs are challenging and often have political components to them. I think that dialogue between government and Ofgem is potentially more valuable in making those decisions than simply giving it a duty to consider net zero in a slightly rhetorical and opaque sense, as opposed to when we are looking at specific decisions.

Q147 **Lord Grade of Yarmouth:** You talked earlier about reframing the market. Do you think we need to look at reframing Ofgem's role in this transition? It is a legacy regulator which has had all kinds of additional remits dumped on it over the years because there was nowhere else for them to go. Do we need more clarity; do we need to redefine Ofgem's remit?

Tim Lord: If we were to undertake a process with government, Ofgem, the system operator and others to look at how we need to reform our markets, as part of that all institutional roles should be under consideration. I think Ofgem has a core and very important set of functions, which I would expect to continue, in its role in consumer protection and so on. I suspect that Ofgem would say that it would be happy to look at whether it has the right set of responsibilities and whether they could be streamlined, reallocated and added to in some way. I go back to the point I made earlier: you have to look at your market design. You need to look at the functions that need to be fulfilled within that, and at where they most appropriately sit. As you say, in some cases these have built up over time and we would not necessarily design it this way if we were to start from scratch.

Lord Grade of Yarmouth: Mr Buckland, in framing a formal remit for Ofgem for the net zero target, how prescriptive or how loose would you make that remit? How do you see that being framed?

Josh Buckland: I would differentiate between the remit and the guidance the Government give to consider how it makes trade-offs as an organisation. The remit itself can be relatively narrow. I do not think you necessarily need to give very prescriptive remit rules and regulations that sit for a period and will not necessarily be changed because they are on the statute book. The question for government is, can they accompany that with a strategic policy statement for government that is updated on a three-yearly cycle, say, and that gives a little bit more guidance to Ofgem about what government's priorities are from a policy perspective and how Ofgem could approach some of those trade-offs?

It would have to be relatively high level, because you need, critically, to defend and support the independence of the regulator, but the advice on trade-offs will at least allow Ofgem to act in accordance with that, accompanying, as Tim has described, a more regular structured dialogue between the organisations to ensure that they are situated. That sort of structure will also allow the guidance from government to adapt as policy moves forward and technology changes, whereas the remit for Ofgem should be set in statute and not move around regularly, because that will not need to reflect the immediate technology challenges the Government are facing.

Lord Grade of Yarmouth: Does it worry you that at the moment, so far as consumers and taxpayers are concerned, net zero looks like a horrible burden? You are going to need the hearts and minds of the British public to help contribute voluntarily in a lot of ways during the transition. At the moment it just looks like a PR disaster, and I cannot see the hearts and minds of the consumers and taxpayers being in any way inspired by the messages coming out, which are all about more and more costs.

Josh Buckland: It is a real time for concern. My view is that you cannot try to sweep it under the rug; that is not the right approach. There is a significant cost and transition challenge, but the thing to remember is that it is a transition challenge. The end state is as good if not better than the current state. You should have lower-cost technologies, and stability in your pricing environment for technologies because they should not be driven as much as by volatile international markets. There are also benefits around technology innovation. If you look at the retail market, you are now able to interact in different ways; there is new technology in the home that makes life better, rather than worse. I think there is a positive story that government can tell about how the opportunity sits.

The challenge is how this supports consumers through the transition, which is clearly going to be difficult. The EV transition is a good example of how it can be possible—long-term regulation supported by immediate taxpayer subsidy, which goes back to the point made earlier about the balance between taxpayer and public investment. That has facilitated and created a market that is now driving value. The challenge is ensuring that that reaches everyone, but clearly the model is potentially there. It is much harder when you get to home decarbonisation, where people are being actively asked to make changes.

I think the Government's broad approach is right, which is that we are going to have to accept that we will subsidise in the near term to try to reduce costs, take up the opportunity with early adopters to drive scale and reduce costs over time, as well as trying to improve the customer journey in that period through innovation, and introducing new regulatory and policy changes. That is only a stopgap measure. It does not necessarily get you to the major scale rollout that you need, where it will not be sustainable for the taxpayer to subsidise massive change. That is where the real conflict comes in, and to an extent government has not yet confronted that. That is understandable, but for me that will be the biggest challenge when we move through the stage of the decarbonisation journey that will probably hit in the mid-2020s.

Tim Lord: The polling data shows us that people are very concerned about climate change, and the cliché that it is a young, urban, metropolitan, liberal issue is not borne out by the data. A report yesterday showed that that concern is shared across social classes and regions, across different age groups and so on. I think you are right that sometimes, this issue is presented as a pure sacrifice agenda that will leave you in a worse place than you were. We hear quite often that we have to give up meat, we cannot go on holiday any more or we will be freezing cold in our homes. The advantage for the political messaging is that none of those things is true or has to be true. If you look at the net zero pathways, it is still possible to fly, to have a car, to eat meat, even if we might do some of those things in a slightly different way and to a slightly different extent.

I think the biggest challenge is with home decarbonisation. First, we have been through some of these transitions before when we moved to a centralised gas grid and off-town gas, for example. Secondly, things like heat pumps are not completely novel technologies. Millions of people across Europe have heat pumps and are satisfied that they can operate effectively, but the key thing for me is making it easy for consumers. At the moment it is not easy to make this kind of transition and, as Josh referred to, it is a question of building the market and the supply chains around those things, so that it is easy for consumers to do that. I recently looked into getting a heat pump compared to getting a new kitchen, and getting a new kitchen is a lot easier and a lot more attractive as a consumer proposition than a heat pump. As that market develops, I think some of those concerns and challenges may be less significant than we fear at the moment.

Q148 **Lord Reay:** I agree with you, Mr Lord, that the polls show that the public are in favour of net zero. However, when they are told that they will have to pay a few hundred quid a year more for it, the polls certainly change. Following on from Lord Grade's question, who do you think should fund the costs of the transition to net zero? Should the burden fall on taxpayers or billpayers, or a combination? What role do companies have in helping customers with these costs, particularly those most affected?

Tim Lord: That is very fair question. The first thing is that we have to get the costs down as far as we can. As I mentioned before, we know that deploying heat pumps in this country at the moment is more expensive than it needs to be because we do not have the installer base and all those kinds of things to achieve it. That is the first challenge in reducing the costs.

Secondly, we talked earlier about the role of borrowing. When we designed the CfD in the power market, the principal objective was getting the cost of capital down, and from that the benefits of deployment innovation and so on would flow. I think we see similar in the transition in the decarbonisation of our buildings: how can we design market frameworks, whether through private borrowing or government borrowing, that can help us drive down the costs of that transition? Those are the two key things that I would look at for reducing the cost of the transition.

The final point is that we have to look at the tax benefits and the fairness of the economy as a whole. This is not purely about having to get every single part of the net zero transition to be fair in and of itself. It has to be seen as an overall transition within the context of a wider economy. We need to make sure that we are delivering it in the lowest cost and most efficient way that we can, but that we are protecting the most vulnerable consumers, those who are least able to pay for this transition, whether through net zero policies or the tax system more broadly.

Josh Buckland: On the overarching question of who should fund the costs, this is a bit of a cop-out but there needs to be a balance. To take a practical example, there was a significant debate about policy costs and green subsidies on bills in 2013-14. I was in government at the time, and it was a pretty difficult debate that led to changes in how the system was structured. That was when we were talking about policy costs of less than £100 on bills. We are now talking about the need for a really substantial increase in investment, and that means you cannot fund the entire transition through energy bills. Energy bills are also inherently regressive compared to other forms of revenue raising from government, irrespective of whether you are looking at the private sector investment side. There is a challenge around the role of energy bills, so you need to think about other forms of revenue formulation and clearly, the taxpayer has a role within that.

There are also opportunities around more effective carbon taxation as a way of funding some of those interventions. That gets you into a fundamental challenge regarding fairness as well, but clearly, there are opportunities in that space, given that carbon is priced ineffectively across the economy and very unevenly across different sectors.

The other thing the Government need to think about and acknowledge is that support and protection will have to be given to those on lower incomes and other customers, whatever the outcome. You cannot expect those on lower incomes to invest significant proportions in decarbonising their own homes, as well as paying higher commodity costs moving forward. Any sort of intervention the Government are planning on how to fund this has to take into account the distributional consequences of that decision, rather than simply the right balance at a macro level.

Companies have an important role in offering consumer finance propositions that make sense. Most people do not pay for their car up front; they buy it on a three-year financing deal. That ensures that a customer has access to a car but does not have to pay the up-front cost. You could see that sort of model starting to develop, and companies are starting to talk about that on the retail energy side and thinking about how they could offer that for heat pumps. That is the sort of innovation that companies can bring to the market, using the power of their balance sheets to spread cost and give better consumer propositions. That seems like a credible thing for companies to be thinking about. The argument we come back to sometimes is that we should just tax companies to force them to invest, or shift in such a way that companies have to recede on their own demands around what they are receiving from the market and the profit they are making.

Clearly, we need to create a market where companies that innovate and offer good consumer technologies can make money from those technologies, ploughing that money back into better consumer innovation over time. That is the balance. Companies have a role but ultimately, you cannot assume that they will spend the money for the good of it.

Lord Reay: On investment from existing investors and new investors, what is needed to give them confidence and what incentives are required? Is the RIIO-2 framework introduced in April going to be sufficient, given the quantity of investment that will be needed?

Josh Buckland: On the RIIO question specifically, my view is that the regulatory structure for the networks can work to unlock greater levels of investment. It is about the technical incentives that sit around it. You do not need necessarily to redefine the whole regime, but you do need to ensure that there are incentives for companies to plan their investment programmes in a way that facilitates the requirements for electric vehicle infrastructure, broader requirements for heat decarbonisation and potential hydrogen or electrification pathways. That can be created through the current RIIO process and Ofgem has already started to do that, offering innovation funding mechanisms as well as thinking about the structure, but clearly there are challenges with the framework and how it changes over time. There are connected challenges regarding the cost of capital expectations and how that impacts the overall framework, but clearly, the framework itself is not necessarily aligned with the net zero perspective. It is a question of how you design the detail that sits around it.

On the broader point—the point I made softly earlier—you clearly need a range of funding sources for the net zero transition. Yes, you need more risk-orientated investment at the near end, and you have great companies innovating in new markets and creating new technology, but you will also need to invest a huge amount of money in operational assets that continue to drive value post the construction period. That is where you need to unlock pension fund cash as well as other forms of taxation. That is where government's investment mechanisms, and the business models we talked about, are so critical, because they potentially unlock a greater source of capital for this transition, rather than a slightly smaller pool of capital on a risk project basis, if you see what I mean.

Tim Lord: The one area where I worry a bit about the incentives to invest is the heat transition. Government have offered more clarity on that through the heat and buildings strategy, but ultimately the decision on hydrogen and the gas network has been pushed back to 2026.

While I understand the rationale for that, for consumers the incentive to move to a heat pump is not there at the moment, in significant part because of the issue that Josh mentioned earlier of policy costs being focused on electricity bills. The Government have said they will look at that, and I think that needs to happen quickly.

The incentives on networks are not necessarily there, because if we are moving away from the gas network over the next 30 years, there is a huge decommissioning and strategic challenge in how you do that, at what point you switch off which bits of the network, and so on. We need to be thinking pretty hard, pretty quickly about the future role of the gas network in order to get those incentives right.

Thirdly, there are huge impacts on the generation incentives. If we are going to electrify the vast majority of our heat—and I think most of the cost figures indicate that that is probably the most sensible thing for us to do—we will need a heck a lot of generation to do that, and we will need different characteristics of that generation because of the profile of heating demand during the year and during the day, particularly in the winter months. For me, that is the key area where we will need a lot more clarity in the policy framework over the next few years, because I think it has implications through the whole system for the kinds of investments that we need to make.

Q149 **Lord Reay:** Turning to the retail energy market, one of the consequences of the recent gas price increases has been the failure of about 20 retail energy providers, with rumours of more to come. To what extent do you believe that the introduction of the price cap and the regulatory framework has exacerbated this situation?

Josh Buckland: The current crisis sped up a trend that was already there, to be perfectly honest. There was a set of relatively poorly capitalised companies in the market that were taking the opportunity of a relatively open market where you could operate with relatively low capital requirements in a way that ensured that you could unlock near-term value through offering cheap fixed deals, but since the introduction of the price cap, at least, that was on a declining market price. As soon as prices rose in the other direction, you faced the challenges that you would have in any poorly capitalised business where you are not prepared for that cycle. The rate of increase of prices is what surprised everyone, and the scale of the current crisis forcing the issue has definitely been a surprise. But the underlying market structure of relatively poorly capitalised companies in some areas of the market was clearly going to unlock change at some stage, and that is what has happened.

The causes of that are the more fundamental issue. The market structure at the moment is orientated around competition on either one or two-year fixed deals for customer share. So, unless you are at the top of the price comparison website offering the cheapest annual deal, you will not gain market share. That means that you are creating a market structure that is driven by short-term price competition. While that is valuable for consumers in the near term, the implications of it are clear. Customers are now paying for the failure of some of those poorly capitalised companies, which raises a question around financial regulation of those companies and the requirements for market entry.

Secondly, it raises an interesting question on the net zero side: is that the right model to unlock consumer engagement and consumer value over time? To take a practical example, going back to the point I made earlier about financing, if you are going to ask your consumer to sign up for a three-year deal to finance a heat pump, you will need a structure that is more orientated around competition on the basis of value and the opportunity to create those sorts of mechanisms, rather than just annualised fixed-price deals where a customer switches in and out and does not have that requirement at least to think about how it operates, such that you are investing in technology for a period. That is the balance.

The current crisis was going to happen at some stage, but it raises interesting questions about how you orientate a market that will support the net zero agenda.

Tim Lord: The level of price shock that we have seen was always going to be problematic in a market like this, and that is probably unavoidable. The underlying issue has been the price shock in fossil fuel markets. The fact that a number of companies appear to have been under-hedged or poorly capitalised is an issue, and I think there probably will be lessons to be learned from that for both Ofgem and the Government.

Looking forward, there is a short-term question, which is, how do you avoid contagion and manage through the next three to six months? As you say, we have seen 20-odd suppliers go bust recently and, if you believe the rumours, there may be more to come. How do we manage through that?

In the medium term, how we avoid this happening again? I worry about a scenario where large energy companies that can get through this crisis take on lots of new customers and hedge at reasonably high prices to protect those customers from future costs. Then, the next year, the gas price comes down again as supply recovers and the market reaches a lower equilibrium, and then a load of new companies come in, hedge at much lower prices and take all those customers back. Then, we are at risk of the cycle beginning again. I think there is a real medium-term challenge for the regulator as we exit from what I think will probably be a relatively short-term crisis, certainly at the level of acuteness that we see now.

The long-term question is precisely the one that Josh asked: what are the right models for consumers in a net zero context? They have to involve long-term investment, long-term relationships with energy companies providing energy as a service, and so on. The way that the market is structured at the moment and the incentives provided are precisely the opposite of that: switch quickly and choose purely on the basis of short-term cost. That is not necessarily going to be the right way to help consumers to deliver net zero.

Lord Reay: Do you think Ofgem has been conducting sufficient due diligence and financial monitoring of these energy suppliers? What changes do you think are necessary to introduce greater stability to the retail market?

Tim Lord: That is difficult to say without having been in Ofgem and seen the due diligence it has done, but clearly there is an issue, in the sense that a significant number of suppliers have gone bust and some of their practices are potentially suboptimal. Ofgem and the Government will want to look at that.

Looking ahead, the key challenge is how we make sure that we are providing consumers with appropriate protection, that the barriers of entry to this market are sufficiently high to protect consumers, and that we avoid these kind of contagion risks; but we must not do that at the expense of innovative business models. You had Greg Jackson from Octopus here. It has been hugely innovative in this market, has changed the consumer proposition and is helping to reduce costs in the short and long term. A key challenge is how we make sure that the barriers to entry into this market are appropriate to provide consumer protection, but not so high that we prevent new business models coming in and providing the kind of innovation we need in business models as well as in technologies.

Josh Buckland: It might not acknowledge it directly, but I think Ofgem has recently said that it knows it needs to bring in tighter regulations on financial checks on companies and due diligence moving forward. That acknowledges that in the past, on the market entry side and the ongoing monitoring, things were not sufficient to deal with the crisis as it is, notwithstanding the fact that the current crisis is extreme and relatively surprising for everyone.

There is a clear need to shift towards a slightly more financial services regulatory-type model. We did exactly that post 2008 and we do not want to go down that route here, but we do want to think about regular capital requirements on companies that, importantly, hold consumers' money. They are not just selling the energy; they have credit balances that accrue over time. Companies should be required to show in evidence to the regulator that they have the ability to finance their functions on an immediate basis but also over a decent period of time, so you do not get a build-up in the challenge of the market.

There are other things that government can do to change the way that schemes are charged: for example, companies being required to pay into collective schemes more regularly to ensure that you do not build up a huge amount of financial risk in an individual company or segment of the market as a result of the policy framework. There are actions that Ofgem can take as a regulator, and maybe you need to think about its co-ordination with other regulators that have a more consumer-orientated direction, as well as actions that government can take in co-ordination with that. That is a near-term challenge that needs to be sorted.

You also need to think about, as Tim acknowledged, the long-term stability question: what you are creating a market for, the long-term objective of the market to create value, and the stability and financial requirements you are putting in place that link to that.

Q150 **Lord Grade of Yarmouth:** I was struck by your use of the adjective "regressive" in respect of consumer energy costs. Is there a strong case for taking the regressive nature out of those consumer energy costs and relating it much more to, for example, stamp duty, council tax? Is that a way forward?

Josh Buckland: I think it is inarguable that the energy bill structure is regressive. The proportion that low-income households spend on their energy is substantially different from high-income households, and that is a challenge. The more you add to energy bills, the worse that challenge becomes. There is definitely a question as to whether you should shift some of the costs that are currently on the energy bill into general taxation. That creates demand around raising additional revenue, and I am sure my ex-colleagues at the Treasury would not welcome a significant impact from the financial perspective as a result of that.

That then raises the question of whether there are other forms of intervention that are less regressive. Clearly, other tax measures are, and they are usually linked in some ways to income. That is the sort of thing that the Government need to think about in the overarching perspective of how they fund the net zero transition. It is unsustainable to assume that you can continually add to bills between now and 2050 without having a direct impact on consumers that is viewed as unacceptable, and that also leads to a significant pushback on the support for climate action.

Q151 **Lord Sharkey:** Dr Jeffrey Hardy of Imperial suggested to us that the system is "crying out" for businesses and organisations that could help disengaged consumers throughout the transition. Centrica has called for a regulatory framework that enables innovative energy-as-a-service propositions that respond to consumer needs. Does the current energy policy and regulatory framework encourage, or perhaps even allow, such new models to emerge, particularly those that reduce upfront costs for consumers? If not, what changes are needed?

Josh Buckland: The current regulatory environment does not necessarily outlaw it, if that is the right word, but it makes it much harder, because the ability for regulation to adapt in the timeframe that is required is not currently there. The pace of change that is going to happen on technology—we are already starting to see that—is not necessarily reflected in the ability to update regulations and ensure that the incentives that are in place reflect the pace of technology innovation.

For me, there is a question about whether the current regulatory framework set-up and the design of the changes that can then come through are sufficiently quick to ensure that the innovation does not get frustrated. There is also a more fundamental question about whether you shift to a more principle-based approach to regulation to ensure that you have a framework that is open enough for companies to innovate with different models.

More importantly, it is clear that no single model will work for the consumer basis. You will have hyper-engaged consumers; you already have that in every market and it will continue. You will have customers who are far less engaged and just want the problem solved for them. Going back to the point earlier, there will be a group of consumers who simply do not have the ability to engage and will clearly need different levels of support.

You need a regulatory environment that allows companies to innovate, whether that in a heat as a service model or in a more fundamentally directed model, and does not frustrate or limit that innovation but ensures that you can deal with different consumer groups in a different way. Ofgem's role is to offer some level of clear consumer protection that sits behind it.

The thing that could break the net zero journey will be a set of actions by a company or a sector that clearly disadvantages consumers. If you are moving to a world of, say, long-term financing models that potentially lock in consumers, you need to think about how you can do that in a way that ensures that customers have full consumer protection rights and are able to make orientated decisions and have redress. That is the kind of role that Ofgem needs to think through if it is going to move to a slightly more principle-based regulatory model that allows innovation to come through in a more open way.

Tim Lord: There are a couple of other issues we need to tackle. One is that consumer understanding of the impacts of their energy use is low. I do not blame consumers for that. It is because some of these issues have not been explained very well over a period of many years. About half of people do not realise that their gas boilers produce greenhouse gas emissions. It seems unreasonable in that circumstance to expect them to be signing up to decarbonising their heating unless that is properly explained to them. That is not just on the energy sector; that is on the Government and other communicators as well.

Secondly, even in the language we use in the energy sector we often talk about the demand side or load when what we actually mean is people in their homes or in their businesses making accurate decisions about energy. I think that putting the consumer at the heart of the system is key.

The third point is the one Josh makes about more informed choices for consumers and more variation in the kind of services that consumers can have, giving them optionality where they want it.

The fourth point, which is hugely important, is accessibility. If you google the low-carbon house of the future, you see a picture of a four-bedroomed detached house with a driveway and solar panels on the roof. Not everyone has a driveway and not everyone has their own roof. You have to build in thinking at the start about how different kinds of consumers in particular with different levels of income or different living circumstances can access different services, because otherwise you will create a big challenge for later.

Q152 **Lord Sharkey:** Taking up the point about what consumers know or what they believe, a recent CAB report found that most customers have a limited awareness of tariffs and services, and they had key concerns about giving up control of their own systems and a reluctance to invest more time even thinking about any of this.

Is there an important tension between the prospective energy-as-a-service proposals or models that we might have and the current reliance on consumer switching? Can we rely, as we appear to be doing, on consumers to embrace change or to be persuaded that change is in their interests in the current circumstances? I note in passing that the heat and building strategy document pointed out that in quarter 2 only 37% of homes had smart meters that were operating in smart meter mode. That is surely a very disappointing and very worrying figure.

Given all these things, the question arises what role the companies themselves and Ofgem should play in preparing and supporting consumers throughout the transition? The particular emphasis in the question is on preparation for all this, because the current signals being sent out, when they are not being ignored or missed entirely, are very gloomy and very misleading.

Tim Lord: I think there is a big challenge in engaging consumers in all this. I have a couple of thoughts on how we deal with that. One is that we need better information, as I mentioned earlier. People, as I say, talk about really fundamental transformations in behaviours to deliver net zero. In fact, I do not think they are as significant as that. Replacing your heating system is a significant challenge, but it is the one big thing that a lot of people can do to play a part in this transition. If we can make it easy for them to do that and explain why it needs to happen, and do it in a phased way so that we are doing the easier bits first and the harder bits later, I think you can engage consumers on that journey.

The second thing is how we automate some of these things. As you say, no one wants to be spending their day going around different rooms of their house adjusting thermostats because they have an app on their phone for the prevailing electricity price or whatever it might be. If people want to do that, great, someone will hopefully sell them that service. But the majority of people will not want to do that, and the extent to which we can automate those services with new business models that treat consumers as an active part of the market that can provide value seems to me the best way of doing that.

Josh Buckland: I have three quick points. I think there is a role for a long-term policy signal. It will not give all consumers clarity, but it at least gives them time and orientation to prepare and, critically, gives companies the ability to say, "I know that's a set target for the deployment of technologies or the frameworks, or whatever, that I'll have to orientate to". That at least drives innovation that prepares customers for that rather than short-term kneejerk reactions.

There is a baseline set of things that Ofgem needs to do to ensure that the sort of innovations that companies want to take through are enabled. Smart meters, which you mentioned, are a good example of that. Half-hourly settlement that ensures that customers are able to adapt is critical. There are also other changes about how you move to a more locationally driven pricing structure to ensure that you are able to orientate the energy system in such a way that incentives and investment are driven in the right areas of the country rather than simply at a generic market level. Those sorts of baseline enablers will allow innovation to come through. There will be many customers who do not choose to take it or who, alternatively, want the company to take the risk on for them through hedging in the market, but at least they enable that wider innovation to come through.

The final thing, and it is slightly repeating what I said earlier, is the customer segmentation point. Any good business should be able to segment the potential customer base and think about which services it can offer to different customer groups. That is what companies are doing and should be doing. They need to tell the Government and Ofgem, "These are the service offerings that we think can be operated for different customer bases that we understand better than you do" and then support that innovation through the policy and regulatory environment. I do not think it is credible for Ofgem to sit there and say, "We think we know what customers will want in 10 years' time", because they are not close enough to the innovation pathway. Companies have a responsibility to support government and Ofgem to create the pathways for the different segmented customers.

Lord Sharkey: Do you see any convincing signs that the companies know that they should be doing this? I ask the question, because I received in the mail last week from my energy supplier an invitation to install a smart meter. I read it very carefully and there was a lot of it. It was not at all clear to me what the benefit was for me. The company is spending a lot of money trying to encourage people to do all this, but it does not seem to have grasped the idea that you need to explain what the benefit is if you are going to get people to change.

Josh Buckland: On smart meters in particular, it is an issue of chicken and egg. The opportunities that will flow from smart meters are not necessarily here now. You need the broader regulatory change, half-hourly settlement, the innovation in tariff structures and the regulatory reform to drive that offering. You also need, ultimately, customers to have different forms of heating and electricity supply and an EV, because that is where the potential opportunity to switch your energy demand comes from. So there is a bit of a chicken and egg problem specifically on the smart meter side.

The Government have to continue to drive it forward as a regulatory intervention. There is a lot of pressure on companies to drive that through; deployment targets are relatively tight and they are seeing that challenge. The key thing that Ofgem will have to think about is how it structures it to ensure that the smart meter rollout continues and does not hold back the innovation that is to come. There will clearly be groups of customers who do not have access to them at this stage or who will not be able to move forward at this moment, but that trajectory needs to fit with the pace of technological change. That chicken and egg problem will be around for at least the next couple of years.

Tim Lord: That is right, and clearly there is a variability in the quality of the consumer offer and the marketing of that consumer offer in the sector. Some suppliers do that very well. It sounds as if, as in the case of your supplier, some do it slightly less well.

The second big thing that we, and Ofgem and government, have to think about is that often the benefit of the individual actions that we as householders take is to the system as much as it is to us. When I install energy efficiency, everyone benefits because I reduce the marginal price of gas slightly and it makes it cheaper for everyone. A key challenge with market reform on the retail side is how to enable people to access the value that they are providing to the system. It is not an easy thing to do, but it is critical in making the case for this reform that, where we are taking actions that have wider system benefits, we in some way understand those benefits and can access some of them.

Lord Sharkey: We were told by the National Grid that none of this would work, the transition would not work, unless we had smart meters installed in every home, essentially. Given the problems you have outlined for selling smart meters, it seems to me that relying on the energy companies to do this, where the benefit is not immediately clear to the consumer, is not likely to be a very successful method of reaching a penetration greater than 37%.

Josh Buckland: There is a challenge with the timeframe. We are now down a line that is driven by suppliers on the smart meter rollout side and probably too far down that road to shift. However, when you get to a certain level of penetration, you will start to see, as you say, some level of resistance from customers who are not able or willing to move in that direction.

At some stage, the Government will have to consider the role for replacement meters being smart meters automatically. They have already started to shift in that direction. Companies are starting to think about innovation and the point at which more significant policy interventions will be required, whether through differential pricing on tariffs or other things. That obviously comes with the risk of consumer and public backlash, rightly. That is the challenge. We are probably too far down road for the supplier-led rollout to shift, but more significant policy intervention over the latter end of the rollout may well be required.

Q153 **The Chair:** Many of our witnesses have complained that Ofgem is not independent, that it is an operational arm of the Department for Business, Innovation and Skills, which means that the debate and the discussion around policy does not have that independent voice, which is important. If it is robbed of that, a lot of arguments and challenge go by the way.

We heard from a Danish witness last week that the regulator there is statutorily independent and can publish and say what it likes and what it thinks is important, and it is well resourced to do so. Do you think we should reform the role of Ofgem so that at least part of it is statutorily independent?

Josh Buckland: I would tend to disagree that Ofgem is not independent. I have dealt with Ofgem in the government world for a long time and it does progress and protect its own independence relatively resolutely in areas where it has the ability and mandate to do so; price control setting and the function of the price-cap design is a great example of that. It has the ability to operate in that independent way.

However, given the level of relationship between government and Ofgem and the need to align policy changes with regulatory delivery, there will always be a slight sense that that conversation is ongoing and so the level of independence is not necessarily consistent. In my experience, however, Ofgem protects and upholds its independence better than many may accuse it of doing.

The critical thing for me is how government can give a clearer remit to Ofgem, which is then reflected in the requirements that it has to operate in a certain way, and how government can give it advice on the political trade-offs that only government can give that then allow Ofgem to think about its own independent delivery programme in a slightly more coherent way. That definitely needs to happen and will help with some of those concerns about the level of independence. I do not think we need to go down a road of completely separating and restructuring the whole regulatory structure to ensure that there is formal independence in that way, because ultimately that will create time difficulties with delivery.

Finally, Ofgem to an extent has been a bit of a clearinghouse over the last 10 years. It has been given additional responsibilities, some of which do not connect to the other things that it is doing. Some of them are very scheme-delivery orientated; some of them are more macro. So, if you are looking at system governance reform, that feels to me like an opportunity to think about how you can reform Ofgem in a way that ensures that it has a narrower, clearer set of responsibilities that allow it to uphold independence through that process. The two connect.

Tim Lord: I agree with Josh. In my experience in government Ofgem was always a fierce defender of its independence, and rightly so. I do not see that as as much of an issue as some of your witnesses might have done. Secondly, I think there is real advantage in the current model in government's ability to have an ongoing and quite dynamic dialogue with Ofgem. The risk of full independence is that it becomes very transactional, and there is risk there, particularly given the scale and pace of the transition that we need. So I would be cautious about that.

Thirdly, there are a lot of independent voices in this space already. The Climate Change Committee is a good example of a fully independent body providing scrutiny and analysis of what government is doing and reporting directly to Parliament. I would be cautious about thinking that a full independence model would not have some significant downside costs as well.

The Chair: Thank you very much. Thank you for joining us today. Thank you very much for your full and interesting answers. That brings this session to a close, thank you.