House of Commons

Environmental Audit Committee

Oral evidence: Greening the post-Covid recovery, HC 347

Thursday 3 December 2020

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Watch the meeting

Members present: Philip Dunne (Chair); Feryal Clark; Mr Robert Goodwill; Marco Longhi; Caroline Lucas; Jerome Mayhew; John McNally; Claudia Webbe.

Questions 144 - 201

Witnesses

I: Andrew Forth, Head of Policy and Public Affairs, Royal Institute of British Architects; Dr Steve Melia, Senior Lecturer in Transport and Planning, University of the West of England; Konstanze Scharring, Director of Policy and Government Affairs, Society of Motor Manufacturers and Traders; and Professor Jim Hall, Trustee Board member, Institution of Civil Engineers.

II: Stephen Fitzpatrick, Chief Executive Officer, OVO Energy, and Founder, Zero Carbon Campaign; Martha McPherson, Head of Green Economy and Sustainable Growth, Institute for Innovation and Public Purpose, University College London; and Sarah Gordon, Chief Executive, Impact Investing Institute.

Written evidence from witnesses:

- Royal Institute of British Architects
- Dr Steve Melia
- Society of Motor Manufacturers and Traders
- Institution of Civil Engineers
- Zero Carbon Campaign
- Institute for Innovation and Public Purpose, University College London

Examination of Witnesses

Witnesses: Andrew Forth, Dr Steve Melia, Konstanze Scharring and Professor Jim Hall.

Q144 **Chair:** Good morning and welcome to the Environmental Audit Committee. Today's session is on our inquiry into greening the post-Covid recovery.

I am pleased that we have two panels of distinguished guests to give evidence to us today. With the benefit of the Spending Review and the publication of the Infrastructure Strategy, we are going to spend time in our first panel considering the infrastructure investment priorities of the Government, and in the second panel considering how the Government are going to pay for it.

We will start our first panel, and I am going to introduce our witnesses and ask them to explain which organisation they are representing and in what capacity. I first of all welcome Andrew Forth from RIBA.

Andrew Forth: Good morning, everybody, and thank you, Chair, for the opportunity to give evidence to the Committee today. I am Andrew Forth, head of policy and public Affairs at the Royal Institute of British Architects. We are a global membership body with around 50,000 members and our aim is to advance civil architecture around the world.

Q145 **Chair:** Thank you, Andrew. We will move on quickly. Dr Steve Melia from the University of the West of England.

Dr Melia: My research concerns the relationship between transport and the built environment, with a particular interest in moves towards more sustainable forms of transport, obviously speaking in a personal capacity.

Q146 **Chair:** Thank you. Konstanze Scharring from the Society of Motor Manufacturers and Traders.

Konstanze Scharring: Good morning. My name is Konstanze Scharring. I am the director of policy and Government affairs at the SMMT. In that role, I have been working for many years on the challenge we have of decarbonising transport. I am looking forward to giving evidence today.

Q147 **Chair:** Thank you. Professor Jim Hall from the ICE.

Professor Hall: Good morning. Thank you, Chair. My name is Jim Hall from the Institution of Civil Engineers, and I am a trustee of the institution with responsibility for carbon and climate.

Q148 **Chair:** Thank you. I am going to kick off straight away by focusing on the recent announcements. The Prime Minister announced his 10-point plan, which he referred to as the "green industrial revolution", and published around the Chancellor's statement the new Infrastructure Strategy to provide a framework against which we should be judging the ambition of the Government.

Do these go far enough in embedding the prospect of achieving our environment goals of net-zero Britain and the Government's immediate recovery plans from Covid?

Professor Hall: We are pleased to see investment in infrastructure in both the Spending Review and the Prime Minister's 10-point plan. Given the economic situation in the short term, infrastructure is a good way of creating jobs. The ONS gives a multiplier of 1.5 to 2.7 on infrastructure investments. In the longer term, it contributes to sustainable development. Investment in infrastructure is going to be essential for achieving net zero. Now is a good time to invest. Interest rates are low.

Infrastructure needs to be part of a strategy. It cannot be switched on and off. There are things that are scalable and can be done quite quickly around buildings, digital and leakage in our water networks, but we need a long-term strategy.

The National Infrastructure Commission was created and published its infrastructure assessment, and it has taken the Government quite a long time to produce their Infrastructure Strategy. We are pleased to see it now. There are a number of positive things within it in terms of net zero and the environment more broadly, but it does not give a clear plan for how we are going to achieve net-zero infrastructure.

The important link step is the sixth carbon budget from the Committee on Climate Change. We hope that will give a much clearer picture of how exactly we are going to arrive at net zero.

Q149 **Chair:** Steve, do you have any observations on this from a transport perspective? The Government announced in March in the Budget, before Covid struck, £27 billion spend over the five years of this Parliament on what they described as the largest ever road-building programme. Does the Infrastructure Strategy take this further forward and at greater scale?

Dr Melia: There are three main things I want to say to you. We might not have time to go into detail now, but you can ask me more about them.

First, as you have just pointed out, there is no point investing in green stuff if at the same time you are actively moving the situation in the opposite direction through things like large-scale road building and expansion of airports.

Secondly, bringing forward the phasing-out of petrol and diesel cars to 2030 and 2035 is a step in the right direction, but it will not be enough. It will be some way short of what we will need to do to achieve a set of carbon budgets that are compliant with the Paris agreement. Echoing what Jim said, we now urgently need that from the Committee on Climate Change.

The third point I want to make is possibly the most controversial one. I challenge the view that building infrastructure necessarily makes any difference to the size of national economies. I have studied and written about this. It is one of those ideological beliefs that is so widespread and so beneficial that no one would want to question it. But when you start drilling down into the evidence, nobody has ever proved that it makes any difference whatsoever to the size of national economies. Building roads and railways, sure, will make big differences to the local distribution of economic activity, but the SACTRA committee in 1999 looked at this and said there were strong theoretical grounds for believing transport investment could boost wider economic performance but the empirical evidence is weak and disputed. When I reviewed that evidence 20 years later, I came to the same conclusion.

Q150 **Chair:** Perhaps you might like to write to us about that. We do not have time to get into the differences between you, the ONS and the Bank of England in this session, but we are interested to see that if you wanted to write to us.

Could I move on to Konstanze to pick up on the point that Steve made about the significant move—and the most significant element of the green industrial revolution—to bring forward the ban on new sales of petrol and diesel vehicles? That is the bread and butter of your industry. What practical implications is this going to have for your members?

Konstanze Scharring: First, we as an industry strongly support the Government's ambition to provide leadership on decarbonisation of road transport. As an industry, we are investing billions in new technologies, zero emission and ultra-low carbon emission. It is a massive transformation of both market infrastructure and the manufacturing sector. It is important to see this as part of the 10-point industrial plan. It is in the right place there going forward.

We should be under no illusion that bringing forward the end-of-sale date for petrol and diesel vehicles to 2030 and 2035 is a massive challenge not just to our industry but to the whole endeavour of providing that leadership. We need to transform a consumer market from current rates to 100% in nine years and, in particular, to look at the opportunities from this transition. We need to create the right conditions that investment can be made and realised in that time so that the transition can be made in the UK.

From our perspective, it is welcome that this announcement was part of the recognition and further investment in these elements of vehicle incentivisation, significant infrastructure rollout and manufacturing and industrialisation of the electric supply chain.

We think it is just the start. Acceleration also means acceleration of investment. We need to work together. This is not just a delivery by my industry but we are invested in many of the 10 points and depend on them to succeed. For us, it is now all about focusing on a clear delivery plan not just for the vehicle market but very much for the delivery of sufficient infrastructure and affordably priced renewable energy that we need to see coming forward and the ability to deliver the investments that will be needed in the manufacturing base to move us forward. That is what we see as the next step.

Q151 **Chair:** Are the manufacturers creating at a sufficient pace the models to allow electric vehicles to be affordable? One big challenge of getting take-up among the public is that, at the moment, they have been the preserve of those who can afford the expensive vehicles.

Konstanze Scharring: You are pointing to the right point about how we accelerate mass uptake. That can only be achieved if models across all price ranges are hitting the market and providing alternatives for internal combustion engine vehicles.

We now see many more models coming into the market. We already have over 100 different models of battery electric vehicles and plug-in hybrids that consumers can choose from. There will be many more in the run-up to 2025.

You rightly point out that the key barrier to mass uptake is that, in truth, electric vehicles are still more expensive upfront in terms of the purchase price. Even if you look at the total cost of ownership, if you take into account the savings you make in running the vehicles put against depreciation and other factors, you still see there is a differential. We need to work together to try to bring this into an equation that is available for more people.

Incentives play a key role there. We are supportive of the plug-in car grant, but the incentives need to be internationally competitive to overcome that price gap in the eyes of consumers.

In answer to your question, absolutely, there will be many more models. There are already many models out there. You will see offers across the board, but the market barrier is still the price difference between the cost of these vehicles and others. We need to work on that as an industry, jointly with the Government, in terms of how this hits the consumer.

Q152 **Chair:** We have some more questions on this coming up in a minute from a representative of a motor manufacturing area. Before we get into that, Andrew, how can we try to design out the need to rely on road building for the future in our urban planning and design?

Andrew Forth: The first challenge we have is that this is a policy area that covers a huge range of Government Departments. Some of the people who will be paying for things will not necessarily be getting the benefits. For example, how do you make more people walk to the shops? You need to have shops and infrastructure close to their homes, but that is not always where it is most affordable to build and there can be huge challenges for people who are looking to build in an area where it is currently largely light industrial work.

The biggest thing we need to see is the Government giving policy certainty to people who are looking to invest. The removal of the zero carbon homes a few years ago was an absolute disaster because the industry had invested significantly and suddenly that incentive was completely removed from them. There is a lack of trust across the industry in the Government carrying through their promises.

The other thing to note is that the built environment is a growing contributor to the UK's emissions. It is up from about 15% to about 19% in recent years. We have to remember that only about 1% or 2% of the building stock is new each year. Buildings that are built today will be around when none of us are, probably. There is a huge challenge in not only making sure that the new stuff is sustainable but making sure that the old stuff is more sustainable.

Chair: Indeed. We have an inquiry going on into energy efficiency in existing homes. We were discussing that matter yesterday.

Q153 **Marco Longhi:** Konstanze Scharring, what actions do you believe the Government could take to ensure the UK becomes a world leader in the manufacturing of electric vehicles?

Konstanze Scharring: Thank you for a really good question. It is all about how we now get the transition going. This inquiry probably comes at a time when we all hoped we would be much further into recovery mode rather than survival mode. We are almost at the end of the year and, if you look at the figures for our industry, production is down 35% and the market is down 30%. These are significant inroads when, as you rightly highlight, we need industries to invest. We need the supply chains to invest. We need transformation of the product ranges, and we also need how we produce to be competitive.

We absolutely welcome the focus reflected in the CSR as well as in the Prime Minister's 10-point plan to invest £500 million of the £1 billion in the automotive transformation fund. That is all about landing essential giga-factories here in the UK to try to locate battery manufacturing close to manufacturing. You need both to have an industry, because there are so many synergies of having them collocated here. If we are not able to land these technologies here in the UK, the superb contribution that our industry makes to the economy in terms of employment, growth and trade will be put at risk. We absolutely want to have a crystal-clear focus on the ability to land giga-factories to transform and grow our electrified supply chain over here.

I want to come back to the fact that we still need to reach the point of recovery. The business environment in which we operate at the moment needs to be stabilised and returned to growth. We all heard the Chancellor say that might take a little longer. We need to be mindful about how we enable businesses to get to the point and then get the confidence that was talked about earlier to invest. Invest more. We need to do that at a different scale.

Lastly, in reaction to the crisis, you will have seen significant automotive packages in our competitor countries that are aimed at similar things to what we are looking at here, both for the market to drive greater uptake of electric vehicles with significant incentives that go well beyond the ones that are on offer here, and also billions of pounds being put into this transformation that needs to happen in the industry.

We very much look forward to 2021 and to the next Comprehensive Spending Review, as we move into an era of even further multiannual allocation and co-investment by industry and Government in this transformation around products and the production lines, landing the supply chains and investors here in the UK to help us anchor these technologies of the future. That will be the focus for manufacturing.

Q154 **Marco Longhi:** Dr Melia, how far does the pledge to end the sale of petrol and diesel cars by 2030 take us in tackling the problem of surface transport emissions overall?

Dr Melia: It takes us some way but nowhere near enough. If you ask me for a percentage, I cannot give you one at the moment because we are still working in the dark until such time as we get a set of carbon budgets from the Committee on Climate Change that are compliant with the Paris agreement.

In the absence of that, a number of academic studies have tried to do their own estimates. It depends on what assumptions you make about the speed of uptake of electric vehicles and so on, but those estimates have all shown a pretty big gap. They come out with answers that say things like we will need to cut the volume of traffic on the roads by between 20% and 60%. That is a very big gap.

It is important to understand that there is a long time-lag between phasing out the sale of petrol and diesel cars and the switch that occurs in the actual fleet in the country as a whole. Norway is a good example. Norway is the first country where sales of electric vehicles are now the majority, but I have checked the most recent figures and the proportion of electric vehicles in the total fleet there is still only 9% after many years of growth. We have to do more on reducing the volume of traffic.

We also have to do more on the heavy vehicles. The cars are at the easier end of the spectrum. We are right at the beginning on decarbonising the heavy vehicles.

The last point I want to make may be one more for Konstanze. Net zero, for most sectors of the economy, is going to mean absolute zero. There is no magic wand that is going to offset large-scale residuals except for a limited range of activities. Net zero means that not only do we have to stop producing carbon in the use of vehicles but we also have to entirely decarbonise their manufacture and disposal. I would be interested to hear from Konstanze to what extent the manufacturers have taken that on board and how they are going to do it.

Q155 **Marco Longhi:** I am about to ask a similar question. Thank you for that. Konstanze, to what extent should the Government prioritise traffic reduction in their forthcoming transport decarbonisation strategy?

Konstanze Scharring: Absolutely, we need to look at all methods of reducing the impact of road transport.

My main issue is around trying to decarbonise the impact of vehicles on the road. From our perspective, it is still a major issue. It might sound easy but it is not easy to totally transform a complex consumer market in less than nine years. A crystal-clear focus on achieving that objective is a critical part of moving forward. It is very important that we look at the whole vehicle park and at how we can reduce now and in the run-up to 2030 the impact of vehicles on the roads.

It is interesting what has happened this year. New car markets are going down, whereas used car markets are stabilising. There is a real issue here that we need to address because, as you can imagine, we also have members on the bus and coach manufacturing side who are invested in public transport, which can be part of the solution Steve was talking about. With ridership going so far down, we need to take this time to look into how we can incentivise the decarbonisation there and bring forward existing Government commitments to bring zero-emission buses on to the roads.

It is still important that we get the new car market moving. We need to look at solutions that do not stifle fleet renewals so that people do not stay longer in older cars. We need to look at decarbonisation of the fuel there. We also need to continue investment by bus operators and others in the zero-emission buses that are part of the solution of a mixed transport environment going forward.

Q156 **Marco Longhi:** Professor Hall, from one civil engineer to another, I thought I would ask you a Treasury-related question instead.

The Treasury is, clearly, going to lose a major tax revenue stream as we switch from petrol and diesel to electric vehicles during the 2020s. What alternative funding models could be used to replace this revenue?

Professor Hall: The Institution of Civil Engineers has been arguing in favour of road user charging for some time, not just for that fiscal reason, although you are absolutely right that electrification represents a shift from a high-tax fuel to a low-tax fuel and that will have major fiscal impacts, but road user charging also provides the capacity to be much smarter about incentivising transport behaviours and using the road network in a more efficient way.

Clearly, this has been a political question that the Government have been cautious about. At the ICE not so long ago we had Andy Burnham, who was reflecting on the implications of the referendum around road user charging in Manchester. That reflects some of the political issues around road user charging. What we have heard about the acceleration of electrification of transport means that road user charging can no longer be delayed as a serious consideration.

Q157 **Caroline Lucas:** Dr Melia, what transport infrastructure investment should we be focusing on to achieve the greatest social and environmental gains? You have indicated that the Government are not on the right track. What should they be doing?

Dr Melia: I accept that we do not have time to go into all the reasons why, but if you look carefully at the evidence and accept that the argument about boosting the economy is very weak, you then need to ask some different questions when you want to answer the question you have just asked, Caroline. What sort of infrastructure should we be building?

We need to forget what is going to create a greater boost for the economy and look at what infrastructure we need. The main driver of this is going to be the legal requirement to achieve net zero. Apart from the issues of electrification of vehicles and so on that we have already talked about, how do you do the rest of it? That is what most of my research and that of hundreds of other transport academics has mainly been about so far.

The answer, honestly, is that it is very difficult. It is not the case that, for example, providing fantastic public transport for everybody in itself is going to achieve a big reduction in driving and carbon emissions. We need a big improvement in public transport to support the change, but to make the change we have to directly constrain the quantity of driving through a variety of different means. While you are doing that, people have a right to expect that the alternatives will be massively improved.

Instead of building roads, we should particularly be putting more money into smaller-scale local transport improvements: urban light rail systems, walking and cycling and so on. They are cheap by comparison to the rest of what we have been talking about. We should be changing our road network to reduce the dominance of cars in urban areas.

Q158 **Caroline Lucas:** Presumably that means we need to be taking planning into account at the same time as looking at transport. If people still have to travel a long way to get to the facilities they need, we will still have this problem.

Professor Hall, could I ask you the same question? Do you agree with what Dr Melia has said, or would you add anything different?

Professor Hall: I agree that one needs to work on multiple fronts in relation to transport infrastructure provision, so we need to work in a multimodal sense. I agree with your suggestion that that needs to be integrated with the planning system as well.

Alongside what has just been mentioned in relation to active travel, railways and buses, I also emphasise the role of digital connectivity. We need to look across multiple infrastructure systems. Of course, that has been clearly illustrated during the pandemic by the way we have all taken a huge leap in the way we can communicate digitally as well as physically. That underlines the importance of continued investment in digital connectivity.

Q159 **Caroline Lucas:** Dr Melia, on the roads programme, you have already referenced this fact and it was music to my ears. It seems rather extraordinary that you can have a £27 billion road-building plan at the same time as saying that you are leading a green transformation.

Tell us a bit more about your assessment. You have said that it is not consistent with our climate commitments. Could you say more about why, something about the carbon intensity of the road building itself and also, crucially, about biodiversity? You have done some work looking at the impact of road building on biodiversity.

Dr Melia: Yes. That is a good question. A study has recently been done that has estimated the carbon impact of the current road-building programme, and it came to the conclusion that it would add something like 20 million tonnes over the period 2020 to 2036. That is an increase of about 5% in the emissions of the strategic road network.

In itself, compared to the whole transport budget, it is not a massive increase, but this is one of those issues where the signal is more important than the size of the change. It is a strong signal to the whole transport system that we are carrying on in the old direction of predict and provide, and expanding capacity for more traffic.

If we are going to achieve these carbon budgets, we have to be significantly reducing traffic. If we were to do that, we would not need all that additional capacity on the roads and it would be a complete waste of money. If we are serious about achieving the Paris targets, it is completely incompatible to be massively expanding the strategic road network.

The impact on biodiversity is incremental and long term, but I would suggest it is even bigger. The biodiversity threat may be a little further away in terms of its impact on human survival, but it is coming not far behind the climate one. There is now a very substantial body of evidence—and I can supply you with all the references you want—that says that one of the biggest barriers to the recovery of damaged biodiversity is the severance created by roads. There is no evidence that the gimmicks that have been tried, like wildlife bridges and tunnels for badgers, have worked.

Q160 **Caroline Lucas:** Professor Hall, do the changes announced to the Green Book put strong enough safeguards in place to ensure that infrastructure investment decisions are consistent with our goals on net zero and nature recovery?

Professor Hall: To quickly respond to the point on biodiversity, we need to look ahead and plan nature recovery networks in advance of what we are doing in relation to infrastructure networks so that planning for nature becomes integral to the way we plan for infrastructure systems. For the time being, they are somewhat disconnected. The nature recovery networks need to be given more emphasis in this process.

We welcome the update to the Green Book, which was published at the same time as the CSR, including the emphasis on accounting for carbon. But the Green Book is only part one of the tools required to arrive at net zero. You cannot guarantee that you are going to get there by looking individually at specific projects; you have to look at how the system adds up, and so how carbon emissions accumulate all the way across infrastructure and the economy. That is why having a firm decarbonisation plan, including a transport decarbonisation plan, which we have yet to see, is so important.

Q161 **Mr Robert Goodwill:** In yesterday's meeting we were talking about how we can retrofit a lot of the existing housing stock. Perhaps I could ask Mr Forth about the ambitions of the Government to build a lot more new houses in the future, and to reform the planning system to allow that to happen. Do you believe those plans from the Government are consistent with our climate change and nature recovery goals?

Andrew Forth: One of the big problems with the proposals is that, at the moment, we do not know enough about what the planning reforms mean. It is a White Paper but it is light on details. There are some positive things. Moving to a single sustainability assessment could be good if it is a good sustainability assessment, or it could be awful. It seems a bit bizarre that they are proposing to legislate on something when they have not even properly consulted on it yet.

One of the biggest concerns that the RIBA and others have is that the focus of the White Paper is not on sustainability. It does not mention the climate emergency or the biodiversity emergency once in the planning reforms. When it talks about design, it is talking about the appearance of new homes, which is important but good design is about a whole range of things: how environmentally friendly they are, where they are built, how they are connected to the rest of the world.

In this context, focusing purely on brownfield development is not necessarily the most sustainable way to go about these things and be compliant with our carbon budgets because we are seeing a real loss of rural businesses and small-town businesses because people are converting those into housing. If people move into those houses, cannot get jobs locally and have to travel to larger towns or cities, we are undoing a lot of the potential benefits we could be getting from good quality new developments.

Q162 **Mr Robert Goodwill:** Has there been a preoccupation with land that is designated as green belt? In my constituency, I tell people that I will not allow any building on the green belt but there is no green belt in my constituency whatsoever. It has become a rather totemic term that politicians bandy around but it does not necessarily reflect the value of that land from an ecological point of view or whether it would help a community to be more together rather than building further out.

Andrew Forth: Yes, completely. At the moment, we do not have a well-informed debate within politics or society on the impact of new buildings and existing buildings on the environment. It is not just in politics and society; it is within our sector. If you look at other sectors of the economy, they do good, detailed analysis of how their products impact the environment. We do not do that at all within construction. We build it and then we forget most of the time, which is pretty terrible.

Looking particularly at rural areas, there are huge amounts that could be done to improve the sustainability of those communities, but at the moment we do not have the right incentives or the right level of knowledge within the population as to what those could be.

Q163 **Mr Robert Goodwill:** In terms of the difficulty of retrofitting existing housing stock, some of which was built decades ago if not hundreds of years ago, is there a case in some of our urban areas for demolishing what is there and building new to meet these targets, or would that be a retrograde step?

Andrew Forth: In some areas, there is definitely housing that could not be effectively retrofitted to meet new standards, or it would be prohibitively expensive, but that does not mean demolishing everything, necessarily. There are lots of great examples where they have maintained the building core and have then built new stuff around that. The concrete within a building is a huge source of CO_2 emissions and there is more we can do to incentivise those to be reused. That is a huge win not just for the environment but for the time it takes to build new stuff and the disruption to people living in the local area.

We have about 1 million property transactions a year and, at the moment, our tax system and the way we do things does not incentivise you to make any improvements at that stage. People will not always want to go through the inconvenience of retrofitting their house, but if they could do it while they are buying or selling, there is real potential there. I would be happy to explain that to you if that would be of interest.

Q164 **Mr Robert Goodwill:** In terms of not having to build on greenfield land, one answer, which was rather discredited in the 1960s, was that you knock down the slums and build high-rise, which means you have much higher density populations and so you do not need as much land. Then the problems with some of those slums became much worse with the high-rise developments. Is there a smart way that we could build higher but build better?

Andrew Forth: We are starting to see that in some places, particularly where you take into account new and existing infrastructure. It makes complete sense to build higher-density stuff around public transport hubs. We are seeing a lot of that in London and Manchester.

We do not have enough parts of the country that have good enough public transport to do that. We have often built these new housing estates, high-rise or not, and then abandoned them. They have not had the jobs. They have not had the public transport, the walking and cycling infrastructure.

If we were doing this again, look at how Cambridge has done it by integrating public transport and cycling into the new developments there. That has huge sustainability benefits and huge quality-of-life benefits as well. It is not just about the environment in this case.

Q165 **Mr Robert Goodwill:** Are day-to-day energy use targets adequate, or do we need to consider the introduction of embodied carbon targets for buildings? You can maybe explain to me and others watching exactly what that would mean.

Andrew Forth: On the day-to-day energy targets, we are pleased that the Government are committed to improving them. They do not go far enough. The RIBA has set a 2030 challenge looking at a 75% reduction in operational energy usage and a 50% to 70% reduction in embodied carbon. That is the actual carbon footprint of the building's structure and fabric. What is it made of? How have those products been manufactured?

One big challenge here is that we do not have a standardised way of doing this. There are lots of different parts of the economy. The RIBA has some examples. The Royal Institution of Chartered Surveyors has another model.

It is an area where the Government can play a big role in working with industry to set a clear standard. The Government are the single largest purchaser of construction products in this country, directly and indirectly. If the Government started saying, "You need to do this," we would see a positive response from industry. That would be adopted quite well by the private sector as well.

Q166 **Mr Robert Goodwill:** Would that mean using more timber and less steel and concrete, and basically having a house as a carbon sink rather than using a lot of carbon to make it?

Andrew Forth: Yes, and also reusing materials more effectively. Most of a demolished building can be reused and repurposed. We do not do enough of that effectively at the moment.

Q167 **Mr Robert Goodwill:** A lot of the discussion we have had is about heat retention and heating buildings but, as the climate warms, we may find more buildings being airconditioned. I was in Canada over a decade ago and the electricity generators told me that their peak demand was in the summer, not in the winter. Are we planning our buildings in a way that takes into account the fact that we might need to cool them as well as heat them?

Andrew Forth: We are starting to do it more. The problem, particularly in housing and especially given that people are now working from home a lot more, is that the quality of the new homes we are building is not high enough. They are not thought about or designed well enough. We are seeing a huge problem with overheating of buildings because they are built cheaply to meet minimum insulation standards, which is okay in the winter but try living in a house that never goes below 30 degrees in the summer. You are not going to do that if you pile them high and sell them cheaply. You need to think about things like how they are set out on a site, where the windows are and the orientation compared to the sun. It is boring stuff but it makes a huge difference.

Q168 **Mr Robert Goodwill:** Maybe try something simple like putting on a woolly jumper when it is a bit chilly rather than turning up the heating to 22 degrees.

Lastly, how far will the Government's green homes grant and energy-efficiency programmes contribute to the levelling-up agenda? It tends to be poorer people in poorer housing, which is the most expensive housing to heat.

Andrew Forth: Any Government spending pretty much is going to be good in this case because there are a lot of people who cannot afford to improve the quality of their homes or they are not able to because they live in rented properties.

The bigger challenge is that there are a huge number of people who will not be eligible for this or who will not think about doing it because there is no reason for them to do it. We have a bizarre situation in this country where we have some of the cheapest unit prices of energy in Europe but some of the highest heating bills and electricity bills. That is because our housing is really inefficient. Our climate is not super cold and it does not get very hot, but we still use far more energy than we should.

We published a paper recently arguing that the tax system needs to be the lever to do this. Things like council tax, stamp duty and business rates should all incentivise people to invest in energy efficiency, whether on an ongoing basis or when they are buying or selling a new property. It is ridiculous that you can still sell a new house that is not energy efficient.

Q169 **Mr Robert Goodwill:** One problem landlords face is that when a house becomes void, they have to pay the council tax in the meantime, unless they have taken the roof off or something fairly substantial like that. Is it a good idea that if the home is being improved from an environmental perspective, maybe they would not pay council tax on the empty house for three months or some other period? Would that be a good suggestion?

Andrew Forth: That would be welcome. There also used to be tax incentives for landlords to make energy efficiency upgrades to existing properties, which could be considered. When people are buying new homes to rent out, or when they are renting out an existing home, you could allow them to reclaim some of the cost against future taxes. There are lots of opportunities to do it. We just do not do it at the moment. Our tax system raises a lot of money and we do not want to touch it because we are worried about damaging the source of income rather than the environment.

Mr Robert Goodwill: Thanks very much. I am pleased that you seem to have your feet firmly on the ground in terms of the evidence you have given to us. Thank you, Mr Forth.

Q170 **John McNally:** Konstanze, looking forward to the spring Budget and green jobs, you have touched on this already but what ideas and what measures could the Chancellor introduce to accelerate the uptake of electric vehicles?

Konstanze Scharring: There could be a strong signal sent to consumers to accelerate the uptake, if we are talking about the uptake itself.

It is welcome that the plug-in car grant saw additional funding in the spring Budget and saw additional moneys moving into it in the CSR this autumn. All in all, that only gets us to the end of the 2022-23 financial year. We need to take on board that these are longstanding consumer barriers: cost, range anxiety and infrastructure adequacy.

A strong signal to consumers to move into electric vehicles could be competitive incentives compared to what is happening in Germany, France, Italy and Spain. It is happening at the moment all over the place. The cost implications are still very high, so this is one thing to do.

The other one—and I spoke about range anxiety—is about infrastructure investment. We covered it earlier. We need to make sure we are not in a bad space and we have the different OLEV charging schemes that are putting forward a good cover for home charging, for workplace charging and now, with Project Rapid, a focus on highways. If we really want to entice not just the early adopters and innovators but people in the mass market, who are much more price conscious and are worried about their mobility needs being met, we need to see more infrastructure going into the ground.

Here at SMMT we feel that is linked to on-street residential parking because most dwellings in the UK will not have the ability to have dedicated off-street charging for themselves. We need to find a solution to this, and it is a combination of charging at destination, charging through Project Rapid and, massively, home charging, because we know that charging for 7 to 22 kWh is very much what we need to see. That is probably in the timeframe to 2025 a £12 billion investment that we need to see. We need to be careful and look at how, by collaborating between the industry, local authorities and the energy sector, we can deliver the charging needs going forward.

From our perspective, this is not necessarily only tied to the spring Budget. A strong signal, as was done in other countries, is to make the longevity of the incentives a little longer than we have done there. This is an accelerated transformation. To have a timeframe up to 2022-23 in terms of certainty and what consumers can expect is not long enough. We need to see it for at least another six years.

We have put proposals to the Government that, ultimately, they could make these vehicles tax-free. In the past it might have sounded extremely radical to make battery and plug-in vehicles VAT-free. Now, when you compare the rates of incentives that other countries are giving, it is not so radical. We need to have a look at it if we really want to entice many more people than the early adopters into this market.

Q171 **John McNally:** You are absolutely right. People need a nudge in the right direction. You need certainty of long-term policies and of the investment going in to follow that policy. That is pretty clear. There is just a wee bit of confusion with the way it is being done at the moment.

In my own family, and where I live, we have had a problem when we have looked at electric vehicles. It is quite confusing when you go to see different types of vehicles and, as you emphasised, the actual range of the vehicles to suit each individual area.

Dr Melia, on the same subject, is a petrol and diesel scrappage scheme necessary to accelerate the shift to electric vehicles, or are there more effective incentives to achieve a rapid switchover?

Dr Melia: A scrappage scheme could have some merit. This is critically about how fast we make the switchover. Clearly, we do not want a situation where we get to 2030 and the majority of sales are still petrol and diesel and we end up with a cliff edge. The sooner we start making this shift, the better.

Some suggestion was floated earlier in the year, at least in the media, of a scrappage scheme. I co-ordinated a letter from transport academics and professionals saying, "Please do not do what you are suggesting." It was being suggested that there would be a scrappage scheme that would allow people to buy more cars powered by petrol and diesel. That would be absolutely crazy.

Q172 **John McNally:** People are being opportunistic.

Dr Melia: Yes. Clearly, if there is a scrappage scheme, it must be purely for zero carbon vehicles to replace the scrapped ones.

I am glad that Konstanze mentioned the charging infrastructure. We have been doing some research on this. I do not know if any of you have had the pleasure of navigating your way around the long-distance charging network in Britain, but it is a mess. It is a completely unco-ordinated, incompatible patchwork. You have to be a serious geek to navigate your way around it if you are going to use these vehicles outside your local area. It is not just a question of spending more or investing more. We also need a stronger lead from the Government to sort out these compatibility issues.

Q173 **John McNally:** Our Committee heard evidence on retrofitting homes and improving energy efficiency. The feedback we have had from experts highlighted the complexity, the delay, the confusion, the indifference in some cases and the cancellation to achieving the carbon targets of millions of homes needing to be retrofitted. The evidence we received did not seem convincing.

Andrew, how can the Government use the tax system to incentivise this and make it simple for people to understand?

Andrew Forth: In a recent report we argued that things like stamp duty land tax when you buy a house should be reformed so that a more energy-efficient home would pay less stamp duty. There are ongoing payments such as council tax. There are also other ways the tax system comes into housing like inheritance tax and capital gains tax. There is huge potential to look at examples in other sectors where more sustainable behaviour is rewarded through the tax system. The more energy efficient your car is, the less company car benefit in kind you pay. Konstanze may have a view on how successful that has been, but we do not have a link between sustainability and the tax paid on buildings. It is a discussion that needs to happen. Given how obsessed we are in this country with housing, it is surprising that we do not talk more about making them more sustainable.

Q174 **John McNally:** What would be your No. 1 priority to use the tax system to incentivise? You have just answered Robert a bit on this, but if you could say, "This is what we need to do," what would it be?

Andrew Forth: There is a strong case for looking at making council tax in England and stamp duty directly linked to energy efficiency.

Q175 **Chair:** Konstanze, I have a concern about the potential for exported jobs if we do not have the manufacturing capacity for new electric vehicles in this country. By moving ahead of other countries with banning the sale of new petrol and diesel engines, are we risking exporting those vehicle manufacturing jobs abroad?

Konstanze Scharring: Absolutely, we need to look into the jobs implication of the transformation. We need to have a good look at the impact on the manufacturing base so that, in the end, we find the perfect balance and the alignment that job creation is outpacing, hopefully, the risk of job losses.

I talked earlier about the absolute need, if we want to be a leading electric vehicle producer, to secure giga-factories and the wider electrified supply chain—batteries, cathodes, cells and power electronic drives—in the UK. This is a whole new set of technologies that we are confident we can be leading in, but we need to try to secure it here to get the jobs, given the circumstance in which existing investors in the UK find themselves. There is a triple-whammy: of Covid implications and the impact on industry; of the uncertainty around where we settle in our relationship with the EU and our trading conditions; and of the acceleration that means we need to invest at pace to secure these things now and not in many years' time, before all the partnerships are developed between manufacturers and battery manufacturers. We want that to happen in this country.

It is important that, to secure and deliver on what many people see as the job-growth opportunities from this transition to electric vehicles, we need to act soon, but we should be under no illusion. The technology is a different technology. It requires fewer parts, so there will be implications anyhow in the job space for the technology, which is why we need to grow those opportunities so they are there and not allow the risk of job losses to outpace growth.

Q176 **Chair:** We have had some evidence that it also requires different skills, clearly, and that the universities are not as forthcoming as they will need to be in training people up more in electrical engineering than in pure mechanical engineering. Are motor manufacturers pressing the educators to help here?

Konstanze Scharring: Absolutely. The key focus for us is not just at the university level and trying to bring the right high-level skills into the industry, which we need to do and is a longstanding issue for engineering. Our focus, and this is where we hope the Government's industrial strategy goes, is to upskill and reskill the existing workforce. This is our top priority going forward. We have put it as our submission that we are looking for quite a modest amount of money to support us in designing the right training modules and blended training for the majority of our workforce. There needs to be at all levels, whether that is the production level or the managerial level, the awareness of the massive changes that are coming, how to stay competitive, how the technologies work and how to adapt your job to do this. It is a top priority.

Skills needs to be at the heart of industrial strategy going forward. Often it is seen as something horizontal and, therefore, not automotive specific, but in advanced manufacturing, with the rise of electrification as well as digitalisation, we need to see a crystal-clear focus. The industry will be focused on this, but we also need the Government to be focused on this.

Chair: I would like to thank all of our panellists from the first session: Andrew Forth, Steve Melia, Konstanze Scharring and Jim Hall. We will move on to our second panel. Thank you very much indeed. You are welcome to stay and listen to the next panel if you wish.

Examination of Witnesses

Witnesses: Stephen Fitzpatrick, Martha McPherson and Sarah Gordon.

Q177 **Chair:** Our second panel will talk about how we pay for this transformation. Welcome to Martha McPherson from University College London. Could you introduce yourself?

Martha McPherson: Good morning. Thank you for having me. My name is Martha McPherson. I head up green economy research at the UCL Institute for Innovation and Public Purpose. We take as our starting point that economic growth has not just a rate but a direction, and that this direction can be tilted in the direction of societal challenges like Covid and the green crisis that we are coming up against.

Q178 **Chair:** Thank you, Martha. Sarah Gordon from the Impact Investing Institute.

Sarah Gordon: Thank you very much. I am Sarah Gordon, chief executive of the Impact Investing Institute, which focuses on growing and improving the effectiveness of the impact investing market in the UK and internationally. We have been discussing our Green+ Gilt proposal with the Chair and others in the Government.

Q179 **Chair:** Excellent. We will come on to that shortly. Thank you. Welcome now to Stephen Fitzpatrick from OVO. Could you say what your role is at OVO, Stephen?

Stephen Fitzpatrick: Good morning, everybody. I am founder and group CEO of OVO Energy. I am also founder and chair of Vertical Aerospace, an electric aircraft company.

Q180 **Chair:** Terrific. Thank you for joining us. Martha, you have provided us with interesting context in your written evidence to the inquiry. Unfortunately, as a country, we have gone through a relatively recent economic crisis in the financial crash of 2008. What lessons can we learn from how we came back from that crisis in terms of what Government action should be taken to build back better from this pandemic crisis?

Martha McPherson: It is important to start with this question because it highlights the longevity of the decisions being made at this juncture. It is easy in a position of decision-making power to feel that you are responding very urgently, that you need to be reactive to the day-to-day crisis we are facing at the moment. We need to avoid the tyranny of the urgent. The magnitude of both this crisis and the response means that it will have the same long-term generational impacts as the post-2008 recession decisions over five, 10 and 15 years. That recession had different characteristics and a different tenor to what we are facing now, but the same questions need to be put. What does economic stimulus look like? Where is it going? What are the outcomes of the stimulus?

There are two elements of the 2008 decisions that we can learn from: first, on the side of stimulus; and, secondly, on the subsequent austerity response. We know from our research at the Institute for Innovation and

Public Purpose that finance is not a neutral element in the economy. The characteristics, the size, the conditions and the financiers drive innovation outcomes, which drive economic growth and drive the direction of travel and the direction of markets. The stimulus of a huge cash injection into an economy is by no means neutral at any time. In 2008 the rapidity reaction meant that policymakers flooded the world with liquidity without specific direction towards investment areas or towards societally beneficial outcomes.

Sometimes outcomes from this approach led to money going more into the financial sector than into the real economy, where genuine change towards building back better can be made. In retrospect, from a green perspective, you can see there was a huge missed opportunity to direct finance towards the needs of the climate, which we were aware of at that time. The Stern Review came out in 2006 and flagged the benefits of strong and early action on climate outweighing the costs. We knew this in 2008, and so the question of why we did not act on it should strongly reverberate through to us here today.

When stimulus packages were developed around things like renewables—and this happened in the US Recovery Act, for example—there were some interesting positive outcomes that did direct and push the market. That stimulus supported renewables assets out of risky unconventional asset classes into infrastructure asset classes, which are much more investable with better returns and better long-term stability for institutional investors, pensions and insurance companies. That is an example of how this kind of stimulus has a long-term impact on bringing down things like the prices of renewables and making that market more accessible today.

Secondly, the flipside of the 2008 learnings is about austerity. The post-stimulus response has been proven to be quite poor policy. Even the IMF has recently admitted within the context of this pandemic that advanced economies that can borrow freely do not need to plan for austerity to restore the health of public finance. That was a piece that came out recently. We are not in position where we are in dangerous territory of borrowing here in the UK, so there is a need to push back on some of the consternation among economists coming out of the Spending Review that there might not be too much discussion around austerity or belt-tightening.

It is also not enough to be excited that we just do not want to have austerity. We need to have a fully joined-up series of plans and a series of levers that come together to point the recovery in the direction that we need, in the direction of green and in the direction of positive healthcare outcomes. The ideas that need to be taken up and need to be aligned are very much in plain sight in the UK. We have a strong green finance strategy. We are a champion of climate finance, including disclosures. We have our net-zero target for 2050 in law. We have academics and others working on things like public value, planetary boundaries and a just transition. We are a hub of positive ideas to point the direction of the market in. Those should be feeding our discussion at this juncture.

Lastly, we should also look to how these points and jigsaw pieces are being put together in Europe in the next-generation recovery plan that is going through the processes in Europe at the moment. This has been carefully put together from existing plans from the Green Deal, which came out in Europe in December 2019, and from the industrial strategy, which came out in March 2020. Ursula von der Leyen has said that the next generation recovery package is directed by these two big initiatives as the compass and the motor of that recovery. We also need to think about it in that way. What pieces do we already have? What should be, as Milton Friedman said, the ideas that are lying around that get picked up in a crisis?

Q181 **Chair:** Thank you, Martha. That was very comprehensive. Sarah, we have the prospect now, following the Chancellor's announcement, of green bonds being issued by the Government, which is welcome. This Committee among others has been pressing for it for some time. We also have the announcement of a new institution in the form of the National Infrastructure Bank, which will pick up perhaps where our contribution to the European Investment Bank ends.

Will these institutions and structures allow the kind of patient capital investment by the Government to help achieve a net-zero transition?

Sarah Gordon: They both potentially could. Regarding patient capital, possibly the National Infrastructure Bank has a more significant role.

In terms of the green gilt and what use the proceeds are directed to, we are hoping at the Impact Investing Institute to contribute constructively to the design framework as that develops over the next year going up to COP 26. Of course, the Chancellor announced a series of issuances, so there is the opportunity to build on the initial structure of the first green gilt and introduce, for example, social co-benefits and support for community renewal and other social purpose aims, as well as the environmental impacts.

The National Infrastructure Bank has an incredibly important potential future role in directing not just patient capital but also catalytic capital into the parts of the economy that need to make the most significant transition to net zero. With the experiment—as I suppose one could call it—with the first Green Investment Bank, we saw that with one specific sector, offshore wind renewable energy. It performed an incredibly important catalytic function of taking the risk that private-sector capital was not prepared to take and so stimulated activity and investment in that sector, which then attracted and crowded in private-sector investors. It is absolutely critical at the moment to have initiatives around the transition to net zero that are going to crowd in those private-sector investors given the immense strains on the public purse.

Q182 **Chair:** Is there scope to go down the food chain of investment towards the retail sector? Will there be opportunities for retail investment to help fund this enormous programme?

Sarah Gordon: There is massive opportunity because there is massive demand. We have seen record inflows into ESG funds this year during the pandemic. There are multiple sources of evidence for individual demand for sustainable finance investment opportunities.

Our research at the institute suggests that it would be challenging to have a retail tranche to a Government green sovereign bond, but that does not mean there are not lots of other opportunities, such as a National Savings and Investments instrument or a green ISA. That is definitely worth exploring and there would be market appetite for it. We demonstrated with the Green+ Gilt proposal that there is significant market appetite from asset owners and asset managers with over £10 trillion under investment. That appetite is precisely because individuals and retail, as well as institutional money, are seeking these opportunities.

Q183 **Chair:** That was very helpful. Let us turn to one of the entrepreneurs in the private sector, Stephen Fitzpatrick. We heard yesterday from the Energy Minister that the long-awaited hydrogen strategy is due to come out in the first quarter next year and that the heat and building strategy will come out within two months of the energy White Paper being published, which he said would happen before the end of this year.

Is the Prime Minister being ambitious enough with his 10-point plan and the various strategies that will flow from it to capture the significant demand that we have just heard from Sarah exists within the private sector to help finance some of these new strategic changes?

Stephen Fitzpatrick: It is not for me to say. I have not seen any actual plans. There is a 10-point plan. It is signalling the right intent. It is incredibly helpful as a signpost for the seriousness with which we are taking this as a country. There is not really anything you can invest in at the moment coming from this 10-point plan, so we should be cautious about this. If you ask investors whether they would like to invest in ESG-accredited vehicles, the answer is almost certainly yes; everything else being equal, yes. But if you ask them what rate of return they would be willing to sacrifice in order to achieve this ESG accreditation, I think that is the more pertinent question, and we have to test that. In a world of extremely low interest rates, it is obvious that we should be investing in assets that will help us decarbonise, but where we go with the Government's strategy, we will have to wait and see.

In terms of hydrogen, it is not obvious that there is a lot of technology that we can invest in today at scale. There are a lot of innovation projects that we will need to back, there is a lot of scaling up of current technologies that we will need to invest in, but there is not going to be the kind of scale of investment in the hydrogen economy in the coming years. Over a five to 10-year horizon we can have big expectations but at the moment it is going to be small scale.

What we should be doing, and really can be doing, is looking at policies that will help accelerate decarbonisation at a micro level. In energy systems we often talk about what we describe as the gigawatt-scale system. In investment terms, engineering terms, we think about energy systems at a national level. Much of the investment and most of the innovation that is going to come in in the next decade is going to be at the kilowatt scale. It is going to be in customers' homes. It is going to be hard, slow, retrofit of gas boilers—and we heard an announcement today about gas boilers—insulation and the installation of millions of electric vehicle charge points. It is going to be complicated, slow work that is not going to result in a great photo opportunity for a Minister wearing a hard hat and a high vis vest.

One of the things that we are promoting, electric heat pumps, should be a revolutionary technology in reducing the carbon footprint of our residential sector, but right now, through Government policy, we have more than 3.5 pence per kWh of green and social charges levied on electricity bills. That is more than the entire cost of a kilowatt hour of gas. So we are asking customers, retail investors, to invest in ESG-backed investment schemes, we are asking home owners to replace their fossil-fuel based infrastructure with renewable-electricity powered infrastructure, but we are putting all the taxes and costs of decarbonisation on to the electricity and not putting anything on gas. No amount of financial engineering can make the numbers for heat pumps stack up when you have this real distortion in the energy market.

Chair: That is very interesting. You are not the first person to have told this Committee, in fact this week, about that problem. That is a very helpful endorsement.

Q184 **Claudia Webbe:** I am going to ask about the National Infrastructure Bank to try to tease out how we can set it up to achieve the greatest environmental benefits. Martha, as we know, the Chancellor has announced this new infrastructure bank for the UK. What lessons can be learned from the previous creation and privatisation of the UK's Green Investment Bank?

Martha McPherson: This is a good question. The Green Investment Bank took on a very important capital provision role and filled the finance gaps that rose up due to decreased demand during the post-crisis of 2008. As Sarah has already pointed out, it provided this long-run patient capital and catalytic capital aim. It was generally considered, at that time, to have done a good job in counteracting the downturn for key sectors, and it also performed a role as a key knowledge-transfer hub as well. It trained key specialists. It developed a huge amount of expertise that was then able to be dispersed across the industry, and it was also so specialised in risk that it was able to create and develop innovative derisking instruments that were really catalytic to be diffused throughout the green sector.

Something that we would also potentially benefit from today is the Green Investment Bank's financing of energy efficiency, which is still very difficult. Energy efficiency projects are still notoriously difficult to fund privately but the International Energy Agency sees energy efficiency as the job-making machine of the greening sector. These are geographically dispersed jobs and they are easy to access, and that is something we would benefit from today if it was still in place.

Playing this kind of gap-fixing role, this derisking role, this educational role, this job creation role, this dispersing role is something that we need to think about as we develop the idea of the National Infrastructure Bank.

There is also a point about the ability of that bank to borrow in a way that the British Business Bank is not currently able to do. In a technical sense they are not banks; they are funds more than banks; they are not able to borrow or incur liabilities on their own account, so they do not necessarily have the financial firepower of other investment banks across Europe. So this idea of replacing or substituting the EIB needs to be considered in that sense.

The last learning that has come out of the Green Book review is this question about how you use a new, different type of monitoring framework for evaluating and appraising investment undertakings that are in line with the complexity of the problems we see today, that allows us to move away from static, efficiency measurements towards more dynamic approaches, and to really take on monitoring and evaluation of projects that have to be long, long term to face up to the green transition that we need.

Q185 **Claudia Webbe:** Sarah, as we know, the Chancellor will be setting out the remit for the new bank in the spring Budget. What safeguards would you like to see included to ensure its investments are consistent with our environmental goals?

Sarah Gordon: It is very clear that the National Infrastructure Bank, if it is to be consistent with the 10-point plan for a green, industrial revolution, essentially has to be a green bank; it has to be a bank that has a mandate, an explicit mandate, to finance the transition to a net-zero economy. What we would like to see is that that mandate also makes it explicit that the transition needs both to take into account the negative social consequences of the transition but also to seize the social opportunities that transition brings. For example, around the creation of green skills, around the ability to direct spending, both public and private, to areas and regions of the country that have been historically underserved by that investment, and issues around access. In the earlier evidence session, one of your evidence givers suggested it was contradictory to have a huge road-building plan, for example, at the same time as explicitly committing to some of the net-zero targets. At the moment, it is very unclear that the National Infrastructure Bank is going to have a genuine focus on transition to net zero rather than an infrastructure building programme that is not necessarily consistent with that aim.

Just to clarify, there are very specific projects that the National Infrastructure Bank could commit to, which would also explicitly deliver those social co-benefits. Something around retrofitting social housing and, indeed, housing more generally, which is a massive challenge, and where a guarantee programme, for example, from the National Infrastructure Bank could perform an incredibly important role. There are a number of different elements and we can share them with the Committee if useful, but the Green Finance Institute has just come out with a very detailed report on what the mandate of the National Infrastructure Bank could be and which specific projects it could best be involved in to support that just transition.

Q186 **Claudia Webbe:** Picking up on some of that, such as the capital that is necessary to keep the National Infrastructure Bank going, would you see that as a required condition? What about its independence? Obviously you are saying that net-zero emissions should be at the heart of the new bank. What conditionalities would you want to see?

Sarah Gordon: One potential use of proceeds of the green programme that the Government is going to launch from next November is to provide seed capital and financing for the National Infrastructure Bank. Any green sovereign bond, to be consistent with the 16 other Governments that have issued a green sovereign bond, needs to comply with the green bond principles, which have a very strict accounting framework for how the use of proceeds is applied. That is one way of putting transparency and accountability into the very foundation of the National Infrastructure Bank.

Independence is partly what other evidence givers have suggested, that at the moment there is very little flesh on the bones of the 10-point plan and some very significant contradictions between the 10-point plan and other elements of Government policy, particularly around transport, railways and road building, which need to be clarified to give the National Infrastructure Bank a clear mandate that allows the public and the public sector to hold it accountable for what it delivers.

Q187 **Claudia Webbe:** Stephen, where would you like to see the new National Infrastructure Bank focus its attention? What are the low-carbon investments that we need to derisk to accelerate the transition to net zero?

Stephen Fitzpatrick: The areas that we are most focused on in OVO Energy, and that seem to have the biggest potential for decarbonising in particularly the residential sector, are around heat and transport. I think that the provision of the regulation around the mechanism by which we measure the impact is probably the biggest advancement we could have.

I am not sure there is a massive need for state capital to be put to work here. There is more than enough private capital available. But I think one of the things we see is the ability to prove, or to find an accreditation whereby private capital can be put to work with existing technologies and we can trace back the carbon reduction that comes from the implementation of these technologies.

Where we are at the moment, it is very easy for very large-scale projects to get accredited. At a smaller scale, the transaction costs end up making investments uneconomic. If we think about the couple of thousand pounds that it is going to take to install a heat pump—it could be £5,000 to install a heat pump—the transaction costs around certifying the carbon reduction in order to qualify for the green finance schemes and so on, that is the kind of thing that is going to make these small-scale investments uneconomic.

In terms of the National Infrastructure Bank, when we look at national infrastructure we think very much of distributed infrastructure. So it is not a question of large-scale capital deployment into large national infrastructure; it is going to be the schemes and accreditations that we can do, rolled out at a retail level. To the point that we heard earlier, there is more than enough private capital available for these kinds of schemes. They tend not to have the same kind of concentrated risks that you get with very large infrastructure projects, so they are easier to finance with retail, but we need the right accreditations and platforms.

Focusing on heat and transport, again much more can be achieved through Government setting real targets and standards, and allowing the private sector to go to work. I would urge you against thinking of the decarbonisation of the UK economy as something that can be designed in Whitehall and rolled out from a set of centralised Departments in the UK Government. This is going to be done, by and large, by businesses, home owners, and citizens, and finding the right platforms in which they can invest their capital and time and make their own transitions will be very important.

I know we are short on time, but my suspicion is that everybody is very focused on the green recovery right now but, as the economic pain bites in years to come and as stimulus wears off, my fear is that we will see a resistance or a division in society between those who can and those who cannot afford to think about decarbonisation. I worry that if we do not figure out a way to make sure that those who can best afford to pay are going to be paying the price for decarbonisation, we are going to leave a lot of economically challenged citizens behind. They are going to resent the increases in costs that are put on their cost of living as a result of green policies and we are going to see, as we have seen in some other countries, the subject of climate change become a very politically divisive issue.

I have put forward and fronted a campaign, the Zero-C campaign. We think that the best, most effective way to enable decarbonisation is to put a universal price on carbon and to let individual businesses and home owners decide. Again, this is what I see when I look at national infrastructure banks and very large-scale policy decisions. My view is that if we want to bring the population with us, we need to make sure that those who are responsible for carbon emissions are the ones paying, and the simplest, most effective and most efficient way of doing this is going to be to put a price on the carbon and then let the markets get to work.

Claudia Webbe: I guess we also need to eradicate the private sector from investing in fossil fuels as well. As I am sure the Chair will indicate, we are picking up the wider issues that you mention in our other inquiries, but obviously we are focused on the National Infrastructure Bank at this precise moment.

Q188 **Marco Longhi:** I have three questions, and I think they are all for Sarah Gordon. How big a role could the Chancellor's sovereign green bond play in financing our investment in net-zero infrastructure?

Sarah Gordon: The short answer is that it could play a huge role. We are very keen, and I think this refers back to the earlier points about balancing between the needs for economic recovery, levelling up regional inequalities and the transition to a net-zero economy, and this is all about creating a future-fit economy. We know that the skills we need in the economy, the jobs we need in the economy, are going to be ones that are suitable and appropriate for a net-zero future. This is why we think it is so important to think about the financing of the transition to net zero with the dimensions of skills, jobs, community renewal and the social impact I mentioned. I think the green gilt could play an enormously important role in that. As we were saying earlier, because it is a series of issuance, we can build on its relevance and effectiveness over the coming years.

Q189 **Marco Longhi:** How do you believe the UK and the City of London compare with other countries when it comes to the issuance of green bonds?

Sarah Gordon: That is an extremely good question. There have been points over the last few decades where the UK has really shown global leadership in sustainable finance and in thinking around sustainable finance. We were at risk of falling back in terms of that leadership. As I mentioned earlier, 16 other Governments have already issued green sovereign bonds and it is high time that the UK did so, so we were absolutely delighted to see the announcement. However, I think there is real opportunity for both innovation around the nature of green gilt issuance and, as I mentioned before, this element of closely defined, carefully defined, social co-benefits, which is something we really should be thinking very carefully about, particularly given the massive unemployment crisis that is about to hit this country. We need to think about the transition in close proximity to the economic challenges and opportunities that we face.

In terms of the City, at the moment, in the global ranking of investment banks that support and underwrite these kinds of sovereign offerings, the UK banks do not rank highly. For example Crédit Agricole, which has been extremely active in supporting the French OAT green issuance, is very high up in the ranking for green sovereign bond issuance globally. There is a real opportunity, a real business case, for the UK's banks in terms of building expertise, building credibility, in the sovereign green market. There is already a lot of expertise around this and obviously, as we know, deep pools of capital in the City that are keen to be deployed for green and sustainable ends. This is something that really could be part of the City of London's global offering to the world, post Brexit—leadership, innovation, pioneering steps in sustainable finance.

Q190 **Marco Longhi:** Brilliant. Thank you, Sarah. I have one final question, and I will be as brief as I can.

The Treasury has traditionally been quite wary of ring-fencing revenues. How can we ensure that any money raised from a sovereign green bond delivers additional green investments?

Sarah Gordon: These are two critical challenges that you rightly raise.

Hypothecation is not a necessary requirement for issuing a green sovereign bond. What has been the case in other countries, for example France with its issuance of OATs, is that the issuer documents a schedule of projects with a notional equivalence to the proceeds, so you guarantee that the amounts raised through the green gilt issuance would be devoted to green projects and you must specify those green projects. There is transparency in that sense. As I mentioned earlier, you would also expect any green gilt to follow the green bond principles where there must be an annual report accounting for the use of proceeds.

Finally, on the additionality point, we tested our proposal for a Green+ Gilt with market participants. There is wide acceptance in the market for a mixture of financing new and already existing projects. The market really is accepting of a 24-month look-back period in terms of existing projects. I think there is a judicious mix of flexibility that has allowed the Government, with the helpful precedents from France, Germany and elsewhere, to find reassurance on the historical hurdles, which it felt inhibited it from issuing a green gilt, but there is also transparency and accountability, which would be baked into such a bond.

Q191 **Feryal Clark:** Martha, as you know, the Bank of England has increased its corporate bond purchasing in response to the crisis. How could that be used to help promote a green recovery?

Martha McPherson: When we talk about the Bank of England, we talk about its role in two different ways.

First, it is the role of the Bank to provide financial stability and risk management as we direct towards a green recovery. Secondly, echoing Stephen to some degree, it is about the fact that we cannot just focus on public finance, not least because it is not of the magnitude to gap-fill on the climate-crisis needs that we have. The Bank's role is in sending the right signals to the market, and the focus on the green recovery is just as paramount here.

I will talk about the bond purchase scheme in just a second. First I will quickly reiterate some of the points that have been made by other members responding to this inquiry in other hearings, which is about the CCSF and how the Bank of England can use this to support a green-focused recovery. Of course, we do not know what is going to happen next with the CCSF. It will eventually be developed further in March, or maybe not—we don't know—but it is important to think about whether conditionality should be climate related, and whether climate-related conditionality should be attached to the CCSF mechanism.

I reinforce that these kinds of conditionalities are very much a once-in-a-generation opportunity, whether they are on emissions targets, green R&D investment or dissuading carbon-intensive materials. In how we talk about conditionalities, it needs to be remembered that they are not there to provide difficulties or barriers. Instead, they are there to align corporate behaviour with the long-term desire to lead that we have identified as a country. If we are heading towards a greener economy, as outlined by all these different jigsaw pieces of policy, the companies that switch their organisation, their business activities in that way the soonest, are the most competitive and become the most innovative.

The conditionalities in that sense should really be seen as a carrot and not a stick, and I think this is a narrative shift that needs to happen. Also this concept of narrative overall is something that is very important. Citizens as well as organisations and businesses need to know what is going on and what they can expect.

To come to your point specifically on the corporate bond purchasing scheme, this is something we have written about quite recently at the Institute for Innovation and Public Purpose. We have also sent a recent letter to *The Guardian* signed by 100 other economists that we work with, to call for the Treasury to equip the Bank of England with an updated mandate that more clearly outlines its role in being able to support the green recovery. This comes to the corporate bond purchasing scheme and our recommendation that the Bank of England, in collaboration with relevant Government Departments, should go further to identify an exclusion list of potentially harmful corporate activities that are beyond the pale, things like deforestation, and should exclude the most carbon-intensive assets from the corporate bond purchasing scheme.

Back in March 2020, Andrew Bailey told the Select Committee this was a "perfectly sensible thing to do", a perfectly sensible way forward and a priority for action. That feeds into a much bigger ongoing conversation about the Bank of England's remit, and the discussions being had by central bankers around the world about the concept of market neutrality and what it means to be a central bank that has mandates around financial stability and not just climate but nature-related financial risk, biodiversity risk and environmental degradation risk.

These are the recommendations we would make, and I can share more detailed discussion on that, if that is useful.

Q192 **Feryal Clark:** Thank you. You mentioned the remit of the Bank. The Bank recently told us that it is not within its remit to take climate change into account in its bond purchasing. What would you say to that?

Martha McPherson: I would first reflect back to the letter signed by economists making that recommendation. Secondly, if there is a need to undertake a mandate shift, this needs to be a baked-in step as part of the green recovery. It is also worth noting that the remit letter response, back in June of this year, specifically referenced climate risk and climate change as a strategic priority and even the Bank of England's role in the green finance strategy. So I think there is maybe more nuance there, and more discussion to be had.

Q193 **Jerome Mayhew:** Stephen, we have learned a lot about how to support low-carbon electricity generation over the last decade and it has been pretty successful in driving down emissions. What lessons do you think we can learn from that sector, and how can we apply that to decarbonising the transport industry and other sectors?

Stephen Fitzpatrick: I am sorry to say that, despite the fact the UK is leading the way in decarbonising the power sector, we have only done the easy part. We have about 45% of electricity being generated from renewable sources. As we push towards 100%, so the complete removal of fossil-fuel based and dispatchable power generation, we are going to need a complete re-engineering of the energy system, one much more based around intelligent demand control and the electrification of energy demand rather than just generation.

It is incredibly complicated to achieve. The decarbonisation of heat and transport will lead not only to a massive increase in electricity demand but also correlated demand. In other words, we are going to see a big increase in the correlation of electricity demand through heat, for example, when the temperature drops and everybody will need more electricity at the same time. Without changes to the way electricity markets are regulated, and especially a massive change in Ofgem's remit—much more important, I would say, than the remit of the Bank of England when it comes to decarbonisation—we are going to need to see a step change in the sophistication of the way we think about energy systems, such as regulation, policies, legislation and so on. At the moment, when we think about financing the decarbonisation of the UK energy sector, that comes after this change in policies and regulations.

So, back to your question, what have we learned? We have learned that mechanisms such as feed-in tariffs and contracts for difference have been extremely powerful in mobilising private capital into the zero-carbon sector. We have learned that, without the right set of regulations, it becomes almost impossible to finance or commercialise existing technology.

If I think about the feed-in tariffs around photovoltaics, we very heavily subsidised the roll out of residential photovoltaics. It did not require any, as far as I can see, meaningful Government or public capital. A million homes in the UK have had solar PV installed, almost all of it with low-cost private capital, based on a simple feed-in tariff mechanism. The subsidy was probably too high in the early days, and the costs fell very quickly. There was a lot of money made by private sector firms, and we are in a situation now where we have almost abandoned residential solar PV.

We have moved away from these mechanisms that encourage private sector capital into distributed infrastructure in favour of things like large offshore wind programmes and, the worst of all possible technologies, nuclear. We are saddling UK consumers for decades to come with dramatically overpriced power from nuclear at Hinkley Point. For a fraction of the money we are spending there, we could mobilise private capital into energy efficiency, decarbonisation and the distributed infrastructure that I have discussed.

As we have also discussed, we need to, and can, support hundreds and thousands of new jobs, especially in regions and parts of the UK that suffer from extreme rates of fuel poverty, poverty generally, and also high levels of unemployment. I would encourage all the Committee to give some serious thought to their own views on it and to try to challenge the pretty consistent view that we are going to decarbonise the UK economy from the centre and through large-scale infrastructure investment. It is going to be done at the edge of the grid, it is going to be done in the regions, and it is going to be done at the kilowatt scale.

Q194 **Jerome Mayhew:** What I am taking from your evidence this morning is that private capital is going to solve this problem, and that the market needs to be given long-term market signals by the Government—and by "long term" I mean something that is worthwhile getting involved in, and you have confidence that you can stand behind this for 10 or 15 years, or that the Government will stand behind it—and then get out of the way and let the private market solve the problem and do it efficiently. Is that the core of your message?

Stephen Fitzpatrick: It is a good summary. There are a few things that we need to stop doing. Having social and environmental costs levied on electricity bills is very regressive, it hurts the poorest the most, it distorts the market for zero-carbon technologies. So I would take those off our electricity bills. Then there is a bunch of regulations that are unhelpful, and Ofgem has been particularly slow in adapting.

I understand that technology is changing very quickly, and it is difficult for policymakers and regulators to keep up with changes in technology, but they have not embraced their mandate for zero-carbon transition. They are not working particularly hard, it seems, on the regulatory platforms that will be needed to support private capital in decarbonisation.

There is a bunch of things we need to stop doing, and there is a bunch of things we need to start doing. In particular, a very simple carbon tax, which has a wide degree of public support, that would ensure higher carbon intensity activities face a higher cost of capital, which is something we all want to see. Lower carbon activities will receive a lower cost of capital and, over the long term, that is the thing that will make the difference in terms of shifting finance towards this zero-carbon transition.

Q195 **Jerome Mayhew:** That moves us neatly on to your Zero Carbon Campaign, which is essentially putting a carbon tax across the economy. Does that not run the risk of penalising poorer consumers in the way that the levy on electricity currently does? How do you square that?

Stephen Fitzpatrick: The way in which you raise the revenues that would come from a carbon tax, and how you distribute those revenues, are two different challenges and it is super simple to create a mechanism where you can ensure that, below a certain threshold, energy consumers are better off under a carbon tax. The alternative to taxing carbon is a never-ending slew of regulations where you start to ban certain technologies or activities.

When we are talking about getting to net zero across the whole economy, net zero would imply this tremendous shift in our economy and the way we live our lives. It is simply not going to be possible to regulate for everything. Regulation is going to play its part, but in terms of ensuring that the worst off in society are not paying a disproportionately high cost, it is obvious to somebody who runs an energy company, and anybody who thinks about it, that those households that own two vehicles, that own larger cars, that have larger homes, that have a higher carbon intensity lifestyle, that fly more frequently, these are the people that should be paying a higher price.

The fairest, simplest way to do it is to levy a price per tonne of carbon and then let people make their own decisions. As I said, it is very easy to imagine a scheme where we can ensure that lower-income households are compensated, or at least that, in some way, the burden that falls on them is softened by the state through redistribution, but the cheapest, most efficient way to do it is through carbon taxation.

Q196 **Jerome Mayhew:** Yes, and regulation is always a blunt instrument and would be misdirected and be inefficient in a way that the market just isn't; the market is just naturally more efficient because people make their own choices.

But there is one other problem with it, and that is the international context. If you raise the carbon price for all of our manufacturers, for all of our business, and that is not matched by, to pick a country at random, China, all we are doing is offshoring our carbon manufacture. We are going to disadvantage, and destroy, in fact, our own domestic manufacture, and we will just import the carbon from abroad. Without border adjustment tariffs, is it possible to implement what, for my money, sounds like a very sensible suggestion?

Stephen Fitzpatrick: One of the things I am most proud of is that the Zero-C campaign has managed to get organisations as diverse as King's College, UCL and Greenpeace together in one tent to support this relatively simple mechanism. Border adjustments are definitely part of the required solution, and you are absolutely right that we have, in the UK, reduced our carbon emissions substantially since 1990, but a large proportion of that is coming from the offshoring of that carbon intensity.

Having a system of border adjustments means that we will be supporting UK manufacturing. Where we have a lower carbon intensity power system, we will actually be supporting UK manufacturing, supporting the reshoring of manufacturing capacity and removing this carbon arbitrage that comes from the offshoring of manufacturing. My best guess is that we are at the point where many countries are considering this shift towards carbon taxation, and I imagine that the world will very quickly converge on a global price for carbon.

In leading the way, we get to signal, first of all, that the UK is the best place to launch or run a zero-carbon or low-carbon business, and also give our industries a head start. If you imagine that, sooner or later, there will have to be a global carbon price, those countries that have higher carbon intensity manufacturing and industry will be disadvantaged. In moving first on this, we get to signal our intent and give our industries a head start.

You are absolutely right that border carbon adjustments will be an important factor. If you look at the recent election in North America and the movement the EU is taking, I am sure we will be in good company and find that harmonisation of carbon taxation will soon be a real and present benefit to us.

Q197 **Jerome Mayhew:** Yes, and I noticed in a recent conversation I had with Mark Carney that he described these kinds of tariffs as inevitable. So it is just a question of when, not if, I suspect.

Finally, I have to do some due diligence for your evidence. Would the introduction of a carbon price benefit your business interests, and should we discount your evidence accordingly?

Stephen Fitzpatrick: We have a business that sells gas and electricity. We install boilers and other fossil-fuel based heating systems. At the moment, like every other energy company in the UK, we are reliant on fossil fuels, as we all are in our lives. I cannot imagine any ways in which a carbon tax is going to benefit OVO Energy other than the fact that we are investing heavily in zero-carbon technologies such as heat pumps.

There is a transition to make, and every company is looking forward to the next 10 years now, especially given the 10-point plan, which we have said is a helpful start. We have to assume we are going to design our businesses around a zero-carbon future. So to that extent we will benefit, but there is no direct benefit that OVO Energy or Vertical Aerospace will get from carbon taxation.

Q198 **Jerome Mayhew:** Martha, your submission talked about the need to accelerate decarbonisation in transport, construction, the buildings industry and the like. Would the rising carbon price that we have just been talking about be an effective way to drive that?

Martha McPherson: It is really interesting to hear what Stephen is saying. Carbon pricing is, of course, effective but it can be, as you said, a relatively blunt tool. Carbon pricing is one of the many levers that need to be pulled by the hand of Government, and it is important to remember that the reason these regulations are put in place is because of the inherent uncertainty of innovation. We don't know in what direction technology is going to take off. We are looking at potentially more of a transition than was taken in the industrial revolution, so we need to think about setting out a number of quite distinct pathways to crowd in, to mobilise, private sector action rather than the lack of a distinct pathway right now, which I think is a bit of a deterrent. We already have, because of Covid, dampened demand for production and consumption, so yes—

Q199 **Jerome Mayhew:** Can I pick you up on that? You are quite right that we don't know which way technology is going to go, and isn't that why a carbon price is the most efficient way of signalling demand to the market? Then the market finds its own way.

Martha McPherson: One has to remember that all these different pathways of innovation and economic value creation are cumulative, and it is collective over time, with public sector action and private sector action coming together to point us in a green direction. Carbon pricing can play a very important role in that. I would just say that it is not the only thing that needs to be done. If it is the only thing that is done, you will tinker in certain places but not shift the whole economy.

Q200 **Jerome Mayhew:** Finally, just to wrap up the session, I have a free-for-all question.

We have the spring Budget coming up. You have the ear of the Chancellor. What is the most important step that the Chancellor could take to align the recovery with the UK's environmental commitments? If you could say one thing, what would it be?

Martha McPherson: What happened in the last Spending Review that could be reviewed here is that there are a lot of different reviews of tax; taxes cannot really be tinkering around the edges, and different taxes get different treatments. They need to add up to a full plan of how to actively tilt the playing field in a green direction. They all need to come together.

There are some really exciting and ambitious things that can be done to take taxes in a green direction, looking at taxing materials more than labour. At the institute, we are doing a really interesting piece of work with the region of Biscay in northern Spain. They are looking at fully aligning their tax policy with the UN's sustainable development goals. I would be interested to see some innovation there.

Stephen Fitzpatrick: I think you know what I am going to say. We don't know which technologies are going to win or which technologies consumers are going to want to adopt. By far and away the best thing that the Chancellor could do is signal the UK Government's intention to tax carbon. If we want to eliminate carbon from our economy, sending that very clear signal that we are going to start to tax carbon, and there is a low but increasing and predictable price that you will have to pay to emit a tonne of carbon, over 30 years that will have an enormous compounding effect, but we have to start today.

Q201 **Jerome Mayhew:** It is a true free-market move because the emission of carbon is a cost associated with a transaction.

Stephen Fitzpatrick: If I could just add one thing, it is then to ensure that we have the right social mechanisms in place to help low-income households make the transition. Without that, I think we are going to find decarbonisation politically divisive and it will stall.

Sarah Gordon: We need to see that all measures to support a recovery—and the spring Budget will inevitably be focused on that, and particularly around jobs—need to be in the same direction of travel towards a net-zero carbon economy. We have a real opportunity with any future Government support, with the National Infrastructure Bank, with the green gilt programme of issuance, to direct Government spending and Government policy at a just and green recovery.

You have seen other countries, like France for example, put conditionality around their support programmes and their bailout plans for companies like Air France, KLM. We need to see all measures that are focusing on stimulating the recovery support people back into jobs, a real focus on those being green jobs, green skills, sustainable jobs, and in the communities in the UK that most need them.

Chair: This has been a very insightful session, and I would like to conclude by thanking our witnesses, Stephen Fitzpatrick, Martha McPherson, and Sarah Gordon, for their contributions to this session today.

Thank you all very much indeed. Thanks to members of the Committee, particularly those staying with us on a busy day, and to our Clerks, who help put together our briefing.