

Environmental Audit Committee

Oral evidence: Covid and the environment, HC 347

Thursday 21 May 2020

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Members present: Philip Dunne (Chair); Duncan Baker; Sir Christopher Chope; Feryal Clark; Mr Robert Goodwill; Marco Longhi; Caroline Lucas; Jerome Mayhew; Kerry McCarthy; John McNally; Dr Matthew Offord; Alex Sobel; Mr Shailesh Vara; Claudia Webbe; Nadia Whittome.

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Witnesses

[I](#): Professor Kate Jones, Chair of Ecology and Biodiversity, University College London; Professor Frank Kelly, Head of the Department of Analytical, Environmental and Forensic Sciences, King's College London; and Professor Tim Lang, Professor of Food Policy, City University of London

[II](#): Christiana Figueres, Former Executive Secretary, United Nations Framework Convention on Climate Change; Professor Cameron Hepburn, Professor of Environmental Economics and Director of the Economics of Sustainability Programme at the Institute for New Economic Thinking, Oxford Martin School; and Steve Waygood, Chief Responsible Investment Officer, Aviva.



Examination of witnesses

Witnesses: Professor Jones, Professor Kelly and Professor Lang.

Q1 **Chair:** Welcome to the Environmental Audit Committee. We are having a session today with two panels, looking into the environmental implications of the Covid-19 global pandemic as it relates to climate change and to the UK. On our first panel we have three distinguished academics: Professor Kate Jones, Professor Tim Lang and Professor Frank Kelly. I will ask them to introduce themselves very briefly, just saying where they are from.

Professor Jones: I am Professor Kate Jones. I am professor of ecology and biodiversity at University College London, and I also have an appointment at the Zoological Society of London.

Professor Lang: I am Tim Lang. I am professor of food policy, working at the Centre for Food Policy at City, University of London.

Professor Kelly: I am Frank Kelly. I am professor of environmental health at Imperial College London, and I lead the environmental research group there.

Q2 **Chair:** With our first panel we are going to be covering a number of wide topics relevant to Covid and the impact that different aspects of our world may have on it, or it on us—ecology, biodiversity, food security and air pollution—looking in particular at the connections between human health and the natural systems that we all rely on. In the last Parliament, the Environmental Audit Committee undertook an inquiry into planetary health, which now seems all too prescient. One of our recommendations to Public Health England was that it should look at its key performance indicators and consider whether climate change adaptation and awareness of measures to tackle emerging diseases is something that it should look into routinely.

I am going to kick off by asking Professor Jones to explain to this Committee what is meant by planetary health. We have seen an increasing incidence of zoonotic diseases from animal-to-human transmission over the last 20 years with SARS, Ebola, HIV, Zika and now Covid-19. Could you help put that into context for us and explain why there appears to be an increasing incidence?

Professor Jones: Thank you for the invitation to come and explain some of the things I have been working on. The definition of planetary health is the intersection of the health and wellbeing of humans and the state of the natural systems on which they depend. As you intimated, much of public health is focused on human health rather than any of the links to the surrounding environment. In the early 2000s the increase in the effects of climate change were becoming more apparent. It caused the public health community to take notice of the environment in a way that it had not done before and there was a big push to understand the links



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between climate change and public health. That is ongoing now and is a big focus of public health.

Somewhat independently, the ecologists have been thinking about the impacts of ecosystem degradation on things called ecosystem services, which are services that are provided by ecosystems, such as pollination. The service would be pollination and the goods would be crop production and food security. The ecologists have focused on the ecosystem services and had very few direct links to human health, more indirect links. The public health people and the ecologists have not linked the planetary health very well together. There is a lot more nuanced understanding of how ecosystem degradation could impact human health.

One of the widely recognised areas of common ground between public health and ecology is the emergence of these new infectious diseases. As you said before, Covid-19 is one of these diseases, and there is also HIV/AIDS, Ebola, SARS and other diseases. The reason it is an ecological issue is because over two thirds of all human infectious diseases are from animals or are spread by animals, so they are zoonotic or vector-borne. It is not just a public health issue; it is also fundamentally an ecological issue. It is thought that the pathways of transmission between animals and people, and the degradation and change of the pathways between these organisms, is what causes a rise in these emerging infectious diseases. A more nuanced understanding of how ecosystem degradation is impacting these pathways would help us understand the public health impacts of changing these systems.

This is important because, even when you control for reporting effort, the number of infectious disease outbreaks—which is a cluster of cases that are unusual to a particular place or time—has been increasing, as has the number of emerging infectious diseases, which are the ones that are new to humans, like this Covid pandemic. There is evidence that that is also increasing.

I want to end with the example of January this year, which was an unprecedented time. We had three major outbreaks of these zoonotic diseases from animals. The first one was Ebola in DRC; there was the largest ever outbreak of Lassa fever in Nigeria; and then we had Covid-19 in Wuhan in China. January 2020 was unprecedented in lots of ways, and the number of infectious diseases is increasing over time.

Q3 Chair: You have just highlighted the international nature of these global pandemics. We have an international co-ordinating organisation for dealing with outbreaks in humans through the World Health Organisation. Is there a parallel organisation or any international body looking at zoonotic diseases and their increasing prevalence and co-ordinating international efforts to try to understand and combat them?

Professor Jones: There is not. I think it is because it falls between public health, which is the WHO, and the ecology and climate change people who have their own panels, and there is nothing in the middle.



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There are lots of programmes, like the PREDICT programme that the USAID has been funding, to understand what viruses and pathogens are in different animal species. I think there is PREDICT, PREVENT and something else. There are a whole load of these individual programmes but there is no international co-ordinating body. I think it is because it falls awkwardly between two fields that have not spoken to each other or do not speak to each other very well.

Q4 Chair: We will be coming on to talk about the COP on biodiversity due to be held in China, which might be a suitable forum to raise this. I assume from what you are saying that the academic scientific community would welcome some kind of new body being established in order to overcome those barriers and to prevent falling between the cracks. Are you aware of any work that has been done on trying to develop such a body internationally?

Professor Jones: I think the academic community would welcome that. It is not a surprise that this has happened. There were at least three academic papers published in early 2019 that predicted that some kind of coronavirus spillover from southern China was likely. There was even a paper that showed some seroprevalence, as in some spillover that had already happened, of related coronavirus from bats in populations in southern China. The academic community has been warning public policy, and possibly just the other ecologists, about this happening for a number of years. There was even a UN group working on something called Disease X, predicting that this would happen. It is very similar to Covid. Disease X is hypothetical but it has a bigger reproductive rate and infectivity. There has been work thinking about this for literally decades and nothing has happened.

It is one of those things that is so serious when it happens, but it is very unlikely. It is one of those awkward and wicked problems, because it falls between disciplines and is very hard to predict, and environmental change changes all the pathways that I have been talking about.

Chair: The global nature of this pandemic, which affects every country on Earth at the same time, might provide a spur for such action. I am going to bring in Caroline Lucas, who I know has to leave shortly.

Q5 Caroline Lucas: My question is also for Professor Jones. As you have just described, the majority of emerging infectious diseases originate from wildlife. Could you say a bit more about the drivers of those animal-borne infections and what their relative importance is? Should we be worrying mostly about agriculture, deforestation or air travel? What is really driving it?

Professor Jones: Those are incredibly interesting questions, and they are ones that we are trying to answer at the moment. To answer that I need to give a brief overview of the variety of transmission routes so that you can see for yourself what is more likely to happen than not.



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You have animal-borne diseases, so from an animal to a human, and you also have vector-borne diseases, which are from animals, but there is a carrier involved like a mosquito that transmits from people to people via this vector. The very simplest case is an animal to a human. For example, Lassa fever in West Africa causes about 100,000 to 300,000 cases per year and that is an haemorrhagic fever like Ebola. That goes from animal to people and then it stops. It very rarely goes human to human, and that is true in the majority of these diseases where spillover happens all the time, but they do not get in. Some diseases can cause a problem, like Lassa fever. Then there is another case where you can go from animal to people and then people to people, and a very small number of those go human to human. That is very tiny and you probably know the names of them because you know them all, like SARS, Ebola, HIV. They are just a tiny fraction of what happens.

There is another more complex pathway where you have a wildlife species, a domestic animal and then a human. Those kinds of interactions are sometimes very serious where the domestic species is an amplifying host or an intermediate host. It could be that the Nipah virus outbreak in 1999 was through a domestic pig farm, from a wildlife host into a domestic species and then that was amplified into the farmers and that caused an outbreak. There are also more complicated ones where you have a wildlife species, a domestic species, a vector and then a human. Rift Valley fever in Africa is like that. You have to think about those pathways to try to understand and predict what is going to happen.

If you have all those pathways and you thought like a pathogen about how to get from one place to another, you can then start to think about what the drivers are. For deforestation, for example, that might be something where a human is coming into a novel landscape that has not interacted with some of these species before, which could cause a novel pathogen spillover into a human population. That kind of interaction might be causing it. Deforestation might be more problematic for diseases like HIV and Ebola, which we think were the main pathways for that. With things like Nipah it could be intensification of agricultural practices, maybe in wildlife areas that have high biodiversity and high pathogen richness. All species have their own pathogens. They are not doing it on purpose. There is a spillover from domestic species into humans from intensification of agriculture, but it could also be that if you are in a really urban environment there might be some vectors. It could be a human-to-human disease, like malaria or dengue fever. If you are urbanising that area, the vector might like more urban areas; there may be more standing water. Urbanising areas might have a different set of diseases that you change.

If I think about which drivers are more important, we are definitely increasing the hazard. Hazard is the ecological hazard. We are degrading landscapes, we are changing those pathways, so the hazard is definitely becoming higher. Then you have the humans, so you have exposure. We are doing more risky things like going into more pristine areas. We are



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trading animals. We are moving animals and pathogens about, so our exposure is higher, and there is just more of us. If it was a very rare event to get one of these pathogens that goes from animals to humans and from humans to humans, now there are billions of us, so there are billions more opportunities for that to happen. Exposure is also increasing.

The final thing on understanding risk is vulnerability, and some areas are more vulnerable than others. Some areas have better governance than others, or they have higher healthcare provision. You have to think about hazard, exposure and vulnerability to understand risk. I do not know which one is more important, but I think we are increasing the hazard and increasing our exposure. I guess we can do something about susceptibility more easily than we can do the other things.

There are lots of interactions as well. Climate change, for example, might increase the susceptibility of your population by not being food secure or by being exposed to big hazards. It could be that climate change changes your susceptibility but that land use change might change your hazard. I am not trying to over-complicate it.

Caroline Lucas: It is a bit complicated.

Professor Jones: There are three things where change happens and change influences. If you can think about it in those terms, you can operationalise this and make it much more predictive. We tried something like this for Ebola early last year and we predicted the DRC outbreak as being one of those areas where it could be catastrophic by operationalising hazard, exposure and susceptibility. What I am trying to say is that it is not like a lightning bolt. It is not so unpredictable. If we can think about those processes and try to model them, we could start to understand and intervene in those areas in some way.

Q6 **Caroline Lucas:** I think you have explained the interplay of the different processes. That is really helpful.

I have a specific question about wildlife markets in particular. The wildlife trade, as you have said, has been implicated in the disease emergence. Do you think that banning wet markets could be a solution? Is "wet markets" even the right phrase? I have seen some people say "wildlife markets" and others say "wet markets." Could it be counterproductive to do that? I have also seen some people say that, if you ban these markets, you will drive it underground and it will be illegal and even harder to regulate. In a nutshell, if you had to be pushed on it, would you go for banning these markets or not?

Professor Jones: I live in Muswell Hill and we have a wet market. It is called the farmers' market, so a wet market is just a farmers' market that lots of Londoners go to every weekend. A wet market is critical in some parts. It is the only place you can get fresh food. "Wet markets" is not the right term, but sometimes wet markets have a live animal market, and those are the things that I think are risky. However, you have to be



very careful. It is very easy politically to have a statement that says, "Let's ban them" but it is very difficult to do. It could be that we want to increase the biosecurity of those markets and try to stop different species overlapping. When you are stressed, you start shedding diseases, shedding pathogens, when your immune system goes down. These are terrible areas in which to stress an animal in very close proximity to something else.

If you think about it in that exposure, vulnerability, hazard kind of framework, and if you have an alternative—say, increasing protein sources by intensification of agriculture—you might be making the whole situation worse because that might cause more endemic diseases like Lassa fever, for example. You have fewer live animal markets but more people hunting, and so more exposure.

I am not trying to over-complicate, but it is a more complex system and some of these markets are incredibly culturally valuable for the local people. I think you have to have a bottom-up approach to understand how to mitigate the risks from these areas.

Chair: Thank you, Caroline. I know you have to chair an all-party group, so that will explain your room. We are going to move on now to Professor Lang. Thank you for coming before our Committee again, obviously in rather different circumstances. You are doing it from home this time, but we appreciate your commitment to our Committee.

Q7 **Duncan Baker:** Thank you for joining us, Professor Lang. Moving now to the security and sustainability of the UK's food supply system, if one thing is for sure it is that the coronavirus crisis has shone a spotlight on our ability to produce and harvest food. There are considerable concerns about food being left unpicked and supplies being hoarded. Can you set the scene initially and highlight some of the fragilities that you see with the UK's food supply system?

Professor Lang: Yes, I will. Thank you for inviting me again. I am very glad that the Chair referenced back to the planetary health report that the Committee did before. It was a very important report, and Professor Jones has elegantly picked up those themes about the need to integrate ecological and environmental ecosystems health and human health. Of course I would be in favour of that, because food does that.

On your question about the fragilities, my honest answer is that I think it is early days yet. It is very good and I am a great fan of the Select Committee system, but we are only at the beginning of the Covid-19 crisis. Initially, as you know, a lot of people—I think ill-informed—thought it would be over within a few weeks. I will be astonished if it is over in a few years, and the implications will run for a long time. I suspect this Committee and many other Committees in the Commons, and indeed in Parliaments all around the world, will be coming back to that. But right now, after three months, arguably four months, since the beginning of



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the outbreak, we can see some of the fragilities being exposed. They come up a bit like an iceberg and then go down.

The first is supply. There is a just-in-time food system, as now many more people are realising, which is essentially a model of supply chain management and logistics management we have borrowed from the car industry. It is often known as Toyota management and was pioneered in this country by Tesco, which became a huge multinational company by doing it very successfully, very brilliantly. All of that is very easy to disrupt in lots of ways, and many of us outside the food system were very nervous about whether or not the capacity to withstand shocks would be proven. There are people in the retail system at the moment who say, "We have shown there is no mass starvation, no dead bodies in the streets; it is all okay." I repeat that it is early days and we have to remember that there were shocks at the beginning.

The Government, rightly or wrongly, closed down the food service sector, which is one third of the food that Brits eat. They basically said, "You can no longer go there." That sent everyone to only one place, basically nine supermarkets and a few small stores, and no wonder the shelves were emptied. It was a serious mistake at the governmental level to blame consumers for that. It was actually a direct consequence of an understandable, but I think wrong, decision by the Government just to draconianly close down the food service sector.

Stress number one is economic knock-on, and that is rolling in all sorts of ways. As you rightly said in the preface to your question: labour markets, shortage of picking, we still do not know how that is panning out. We know farmers are not planting or are cutting down on planting. Others are saying, "A wing and a prayer, and we hope we will get some labour in" and others like G's, the biggest horticultural firm in Britain, are flying in Romanians. If that did not symbolise something, I do not know what did.

If we move away from that sort of governance area and the political economy of it, there are very big stresses that have emerged—and I think they are long overdue—on the societal front. The inequalities in Britain are enormous. As I think some members of this Committee know, with extraordinary timing a book called *Feeding Britain*, which I spent two years writing, came out just at the beginning of the crisis and I summarise all of this in that. Essentially, about half of Britain, when you strip out other factors, has very little money indeed and food is one of the items that is flexible in the budget. There is great nervousness about that. There were already at least 3 million people dependent on welfare systems or food banks, and we have all the estimates from the community level. I am on the London Food Board, and today I was on a meeting of 70 or 80 people from boroughs all over London talking about the great social stresses. You may well say that is not the Environmental Audit Committee's problem. I think it is because the people are part of the environment, and so there are social dynamics.



If I can end with environmental stress and fragility, food is the biggest driver of environmental damage across the globe. It is the biggest user of water. It is the biggest destroyer of biodiversity, which is Kate Jones's and Frank Kelly's area. It is the biggest land user. One of the things that I think has been exposed is the issue of food security. I know some of the MPs on this Committee are interested in that broad area known as food security. We have to say that one good thing that has happened is that, by the complete reduction of economic activity, air quality has improved; all sorts of environmental indicators that have been really bad news have immediately improved. There is informal information about improvements in wildlife, because we people are not going around wrecking it. There is a paradoxical situation, but against a very bad starting point.

On Britain's diet and how we eat—back to Kate Jones's excellent point—diet is the interface between human health and ecosystems' health. What we eat, how we eat, where we get it from and how it was grown are major factors in the environmental impact of how we live. Food is one of the biggest drivers of environmental damage, and in that sense we do not know. You will have to get us all back in two years' time to see how the indicators have turned out.

To summarise, I am saying that I think it is quite a complicated picture. It is your Committee, not mine, but I am a great fan of that earlier report of yours because I think it was pioneering. It was trying to put together exactly what Kate Jones was saying. We witnesses probably need to recommend to you that you recommend to the Government that there is a better system of monitoring, what the veterinarians call One Health.

I will add a coda to Kate Jones. She is absolutely right that there is no one global body at the UN—I see her nodding—but there is the organisation for epizootics, the World Organisation for Animal Health, which is in this territory, but it is animal health, not human health. Then you get the WHO, which is partly there but not connecting, and everyone knows what Kate Jones said is right.

I want to stress that I think your Committee could address the issue of consumers and the lack of understanding about environmental impact. I called earlier to this Committee that, after this crisis, Britain must have sustainable dietary guidelines. We have to get a grip of what people eat and how they eat, not just for health but for environmental damage, carbon foot load, biodiversity foot load and embedded water. It is staggering how down our mouths goes the environment.

Q8 **Duncan Baker:** I do not disagree with much of what you have said there, but if there are some areas that you feel the Government did not get right at the beginning—we are one of the more developed countries in the world, and there are issues perhaps in our country—what on earth would this look like from a global point of view, where less developed countries cannot possibly have the same ability to react to the issues that we have seen? In your view, looking more globally, are we likely to see a



food crisis across the world?

Professor Lang: The short answer is that the prognosis is not good because most food systems analysts, of which I consider myself one, say there is a permanent state of crisis. We have nearly a billion people not eating adequately. We have all those drivers I referred to in my previous answer of food and how we are growing food, particularly the very large rise in animal production and the use of land to feed animals indirectly, if not directly. Those are major sources of degradation.

The great paradox, and I will just slightly turn it back to you, if I may, is that it is the rich world that is the biggest cause of the damage. How we are eating is disproportionately a driver. It is back to Caroline Lucas's question to Kate Jones: what are the drivers? It is how we are eating. In Britain we eat the most processed diet of any European country. It is the diet that is worst for our health, highest in fat, salt, sugars, but also the highest proportion of meat and dairy. The counterargument comes back—and I am an ex-farmer a long time ago, by the way, if you did not know—saying that Britain's ecology is very well suited in the current climate. You cannot grow mangoes in the Pennines, for goodness' sake. I know, I used to farm in the Pennines. It is not like that. But, my goodness, we have let our horticulture go.

I was born in Lincolnshire and a lot of it is below sea level. We ought to be doubling or quadrupling our horticulture and spreading it. One of the lessons from the ecologists like Kate Jones is that diversification is the key role. One of the strategic things that I think comes out of this crisis—it is a very big reminder, and food analysts in Britain, everywhere, are really interested in this at the moment—is that countries like Britain, which only half feed themselves when they have fantastic land and potential labour, are in a risky situation. There is a defence and democratic issue there that Britain is not addressing. Why? Simply because, if the truth be known, Europe has fed us in this crisis. We are living entirely upon food flows that have been developed over the last 45 years.

Back to your big question about the globe, there are stresses and strains all over the world's food system at the moment. The Food and Agriculture Organisation is deeply worried at the moment about knock-ons of climate change affecting and disrupting cropping. We are in a drought at the moment. There are already crops being affected in Britain. You have a combination of people, the economy, weather and political disruptions. People like me have been saying to the Government, very politely, for two years, "We need a food plan. We need preparation. The Civil Contingencies Act is not working. It should be being applied. There is complacency at the heart of DEFRA." Then we went into crisis management mode; not good.

Q9 **Duncan Baker:** Just to finish off on that slightly wider point and bring it back to the UK, because you have just talked about the potential plan, what would you do to make the UK food system more resilient?



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Professor Lang: I am going to give the clever clogs professorial answer: I would not start from here, but we are where we are. That is where the politics happens, and my job is looking at food politics and food policy.

The first thing is that I think our institutional structures are not good, if I am honest with you. I am sorry to refer to it, but the book I have written, which has just come out, called *Feeding Britain* has a very large section—it is about 20,000 words—and a very serious set of recommendations about what I think we should be doing. First, I think nationally our institutions are not joining up. The picture that Kate Jones gave absolutely applies in Britain. We do not have a food policy committee. We do not have a food advisory group of experts advising Government at the moment. The whole assumption is that supply is all we need to deal with. DEFRA has just literally said, “Leave it to the retailers, the retailers will sort it.” That is only dealing with supply in very peculiar circumstances. It is not dealing with consumption. It is not beginning the process that we know is needed, which is to alter how the British eat.

The simple goal for the future ought to be sustainable diets from sustainable food systems. That, in six words, is what we should be aiming for. That is what your predecessor Committee said about planetary health. I was the policy lead on the EAT-Lancet Commission report, which mapped at a global level what that might look like. In Britain, we need to begin that process of policy development. As part of that, it would be very interesting for this Committee to consider the need to have stronger regional representation. I think there is a mismatch between what happens at the local level in growing, production and farming, and the food ways, if you like, and what happens at the national level. Institutional reform would be my first thing, and making sure that we have much more involvement of local authorities and local food consortia. The local enterprise partnerships cannot deal with this. They are about enterprise; they are not about the environment. The old regional development agencies were not that good, let me be honest, but they have been weakened by becoming LEPs.

The third thing I would suggest is that there is a fundamental issue, which I know is of interest to some of you, of the mismatch between what is grown and what is consumed. Britain has a very big, powerful and very important food manufacturing sector. It is the biggest manufacturing sector in the British economy, but too much of it—and I speak as a critic of it—is about producing what we call ultra-processed foods, high in salt, sugar and fat. We import the things that are really good food, when in fact we have a very benign climate. We joke, we Brits, about our climate. We could and should be using land in a better way.

The fourth issue is thinking about the food system, and I go into this in great depth in my book, and the fifth point I am making is land use. Land use at the moment is, frankly—and I speak as a Brit—away with the fairies. We have 18 million hectares of land in the UK. This is from the Committee on Climate Change, and I summarise all the official statistics



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in my book. Six million of those hectares, that is one third, are what is defined as croppable. Precisely 164,000 is horticulture, yet if I don my public health hat, I would say next to no British people are eating even the modicum of a healthy diet, according to either the World Health Organisation or indeed the Food Standards Agency. We should be eating nine portions of fruit a day. Where is that coming from? If it is coming from water-stressed areas, we are importing their water, not using our own water.

There are a whole number of indicators that I think are needed, and in my own work I have tried to map out what those indicators should be. I can send it to the Committee. In my *Feeding Britain* book, I use stuff developed over 10 years. You can summarise it, even for a busy Minister, in two minutes. You can say a sustainable diet is one that has to meet health, environment, social and cultural factors, quality issues, the economy and good governance. Under all of those, so under the environment for you, this Committee, it is not just carbon. You cannot just say a good diet for Britain in the 21st century is going to be low carbon and low calories. It is partly calories, it is partly water, it is partly biodiversity—Kate Jones’s stuff—it is partly land use, it is partly soil, and all those things you cannot possibly know or get on a label.

There has to be a very complicated restructuring, and that is where it goes back to my first point on institutions. The institutions have to set a better framework. You are the MPs; I am just a professor. I would love this Committee to come up with recommendations to Government that we have to have sustainable dietary guidelines, reshaping our land use and our food supply chain. You cannot expect the food industry to do the right thing if it does not have guidance.

Duncan Baker: Thank you very much. I apologise profusely because clearly I would not have asked that question if I had read your book, so that is the first thing that goes on my reading list.

Professor Lang: I apologise for saying it then.

Chair: I used to be a bookseller and I see you are an avid reader, Tim, from the bookshelves behind you.

Professor Lang: I am. I am embarrassed to have my books behind me.

Chair: This is not, I am afraid, the place to promote works because otherwise all of our witnesses would do that, because most of them have written something.

Professor Lang: It is available from all good book shops.

Chair: We are on to our next one, which is Professor Frank Kelly. Thank you, Frank, for joining us again. You are another big supporter of the Committee.

Professor Kelly: I am.



Q10 **Claudia Webbe:** Welcome, Professor Frank Kelly. My questions relate to air pollution and the virus. Can you explain the links between air pollution and Covid-19 cases? How big a factor is it likely to have been in the number of deaths in the UK?

Professor Kelly: Thank you for the invitation to come along today and for that question. I start by reminding everyone that air pollution exposure is strongly linked with chronic disease development. Because the world's populations are increasingly urban dwellers, and at very high density in those urban areas, their health has been impacted by the quality of air they have been breathing over many decades. As the lockdowns around the world have decreased industrial and traffic emissions, and of course these are major sources of pollution, we would expect that the lower levels of air pollution would lead to improved health statistics. At present, it is too early to confirm whether that is the case or not because we need to disentangle the Covid-19-related deaths from those dying from chronic diseases that are not Covid-19 related, and then to compare that with the number of deaths that would normally be expected at this time of year.

In summary, the question we need to address is whether we will end up with fewer people dying from disease that is not Covid-19 related. If that is the case, there could be a link between improved air quality and that situation. If that is the case, we have to remember this important message post pandemic, because we cannot move back to the bad old practices in our urban areas where we are breaching air quality standards, which we know will lead to these health effects.

Q11 **Claudia Webbe:** Just to explore that a little further, we know that air pollution has impacted on the full spectrum of ages, for example, and in different ways in different cities. I want you to give us a bit more in terms of whether or not those underlying issues in relation to air pollution are at all similar to Covid-19. What is the evidence base around air pollution and its impact on different ages and different communities, et cetera?

Professor Kelly: We know that you tend to have more health problems the older you become. That is why many of our elderly population have chronic disease. We also know that sector of the population has been hardest hit by the virus. There is a strong association there, but we do not know yet that there is a causal link.

Let us start thinking about some of the mechanisms by which the virus may be leading to these deaths. For the virus to survive when it enters our airways, it has to be able to enter our lung cells and replicate itself using the DNA in those cells. It enters the cells through patching to a receptor called ACE2. We know that that receptor is expressed in higher numbers in men than in women, so one of the other patterns we have seen is that there have been more fatalities in men than there have been in women. Again, that is another possible causal link.



The final piece of information we have is that some recent studies done here in London have shown that if you expose lung cells to particulate pollution—tiny particles like PM_{2.5}—it leads to an increase in expression of this ACE2 receptor. People who are being exposed to more pollution may, for that reason, be expressing higher levels of receptor and, therefore, the virus has a greater chance of entering their lung cells, replicating and leading to subsequent major health problems.

Q12 Claudia Webbe: Is there anything that can explain why in young children, where we talk about air pollution impacting asthma and so on, those underlying conditions have not necessarily translated in terms of Covid-19?

Professor Kelly: That is still a mystery, but of course there have been many social changes in respect of the way we are living our lives during lockdown. It could be that the children are not being exposed to the antigens that would normally be triggering some of those respiratory exacerbations such as an asthmatic attack. It may be that the medication those children are still taking is providing them with some sort of extra protection against the virus. It may just be—again, we do not have this information— that the level of this ACE2 receptor is a lot lower in children. It is likely to be a whole combination of those potential reasons.

Q13 Claudia Webbe: Moving on to something that Professor Tim Lang touched on, could you describe the effect that the lockdown has had on air quality? Are you worried that air pollution will increase as we ease the lockdown and more people begin to use things like cars when they return to work?

Professor Kelly: Yes. Thank you for that question, because this is an area that my team have done a lot of work on in London to try to understand the exact situation. There has been a mixed impact on air quality. We have seen major reductions in the gas nitrogen dioxide, especially in city centres. Nitrogen dioxide is primarily produced by diesel vehicles in cities. Because traffic levels have been reduced dramatically, the emission of NO₂ has been reduced dramatically, up to 60% in the centre of London.

The other pollutant that we worry about from a health point of view is these tiny particles, PM_{2.5}. Tailpipe emissions of PM_{2.5} are quite low from modern vehicles, and there are other sources of these particles that are much more important these days. In springtime, normally we see PM_{2.5} episodes in London and that is because of agricultural activities, both in the UK and especially with our near neighbours on the continent. We have again seen PM_{2.5} episodes this year, but they have only gone to a moderate level, not to the high level that we normally expect. What we think is that, yes, PM_{2.5} has increased during lockdown, but it has not increased as much as it normally does. It is a mixed message between the NO₂ lowering and the PM_{2.5} going up.



Thirdly, there is another pollutant that we do not normally talk about much in the UK, and that is ozone. It is much more of an important pollutant in hotter countries around the world, but because we have been having all this nice weather and because we are also seeing these low levels of NO₂ in the cities, which normally reacts with the ozone and keeps it low, we have seen increases in ozone concentrations. This is not good. It could be a window on what will happen if climate change really does progress with increased temperatures in the future.

Coming back finally to what will happen post-lockdown, we are being encouraged not to use public transport. If we need to go to work, we are being encouraged to use our cars. That of course will lead to increased emissions, especially of NO₂ if it is a diesel vehicle. This is a real worry. We will end up having a lot more people commuting to work actively—walking, cycling, et cetera—but, at the same time, they will be beside very busy roads again, so their exposure to these pollutants may increase. I would hope that, as we move out of this situation, we remember the blue skies, we remember the birds singing and as many of us as possible do not lead to an increase in poor air quality again.

Q14 **Claudia Webbe:** Obviously the air pollution has been significantly higher in many cities across the UK. What would be your single message to Government for bringing about the transformation to good air quality coming out of this lockdown? Is your message about diesel, or would you say something else?

Professor Kelly: The message includes diesel but is not only focused on diesel. We have to have much fewer vehicles on our busy city roads. We have to encourage the active transport, the cycling and walking that we have seen a lot more of during lockdown, and we have to invest in clean public transport so we have an alternative to motor vehicles. My message going forward is to look at what we have achieved during lockdown from an air quality point of view. It has been beneficial for the population from a physical and a mental health point of view. Let us learn some lessons from that and try to make sure that all our cities are much more friendly environments and have less traffic on the roads as we move forward.

Chair: I think that is a very good segue into our last round of questions for each of the panellists in this section.

Q15 **John McNally:** Professor Kelly, congratulations on your work. It is almost certain that everyone has become more aware of how much our air quality has improved, as you have just said, especially during this lockdown. The need to build on that awareness is an opportunity not to be missed by all Governments, UK and devolved, and probably across the world. You will be pleased to know that, on the public transport front, Alexander Dennis Limited in my Falkirk constituency has announced that it is hoping to build 10,000 new ultra-low-emission vehicles, and the first of them should be on the road sometime this year. It is building them over the next four years. I think that is great news for us all on air quality.



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In the coming weeks and months, as you have already spoken a wee bit about here, we all know that we need to get our towns and cities back moving again, while allowing people to maintain social distancing. It is not going to be easy, but can you tell the Committee in what creative ways we could use urban design, for example, to create healthier spaces for public transport, walking and cycling that enhance air quality and maintain what we are already achieving with the air quality that we are now enjoying?

Professor Kelly: I think it has been clear to everyone that, because of the decreased amount of vehicle traffic on our roads, there has been improved air quality all around, so we cannot go back to that situation. What we have to do is ensure that there are ways in which the public can efficiently make those journeys by bike or, if it is a shorter journey, maybe by walking, but we might think about other solutions. We have not yet allowed electric scooters to come on to UK roads. Many other European countries are looking at that. That could be a partial solution. Small electric scooters and motorbikes would be another one.

Generally, we have to ensure that the traffic that does remain on our roads is as clean as possible, and that has to start with our public transport system. It is being moved slowly forward. We will have all the air quality data, and we have to ensure that we do not allow that to move back up into a situation where we are exceeding the health quality standards, because if we do that, we know that we are not protecting public health in the way we should be.

Q16 **Kerry McCarthy:** First, a question for Kate about access to green spaces. We are seeing many more people out and about taking their daily exercise. How important is that for people's health?

Professor Jones: There is a lot of emerging evidence about the links between exposure to natural areas and mental health, physical health and cognitive development. There are a number of studies that are coming out now to show that access and exposure to green space is incredibly important for health in general. There is even more cutting-edge evidence that is showing that the type of green space is important as well. Woodlands seem to be much better for you than the length of grass in these parks and the very managed systems. It could be that the woodland has a big role to play in mental health and cognitive development, which we are trying to understand at the moment.

I want to point you to a study by Vivid Economics in, I think, 2017, which tried to look at the avoided health costs of green space in London. It was looking at values in millions and billions of avoided health costs for the green space, just using simple correlations between how many avoided health issues there would be from spending time in green space. The green space in London is incredibly valuable. It does take a lot of money to run, but the investment in people's health is enormous. If you were designing better cities, having more natural areas is a win-win for many things. It could be used for sustainable food production, it could be a win



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for wildlife and it is also good for people's mental and physical health. I would design cities that are much greener than the ones we have at the moment.

Q17 Kerry McCarthy: It is my pet hate when estates are designed with fairly useless bits of grass that look green if you are looking at it coloured in green on a map, but you cannot do anything with that space at all. The movement towards verges not being mowed, partly because people do not have the money to do it and now because of coronavirus, you would say that would be better for people's mental health, to walk along a pavement where there is perhaps a slightly messy grass verge as opposed to a flat piece of grass?

Professor Jones: I think there are lots of win-wins because you can design things that are flood resilient as well. Areas like that could be much better at absorbing water or much better at reflecting sunlight so that they create fewer heat islands. There are lots of win-wins here that we have not explored and there is very little biodiversity value of a mowed area, which is mowed to an inch of its life and has pesticides poured on it. It is not good for anybody. I welcome things like having wild areas and things overgrown a bit. I think there is a cultural issue perhaps about what we expect in public spaces being very pristine and very clipped, but it is much better for us if they are a bit messier and have more biodiversity.

Q18 Kerry McCarthy: It is very interesting that you say it is not just about biodiversity, which is usually the argument put forward for allowing things to get a bit wild. I think it is probably the level of stimulation you get from being somewhere where there is a lot going on as opposed to a flat piece of grass. That would be why it is so good for mental health.

Professor Jones: Yes, I have to admit that we are just looking now at the actual mechanistic links between visual stimulus, concentration and how that affects cognitive development. That is an interesting area of research. Interestingly, being in museums has the same kind of influence. It is periods of concentration on objects or creation, like creating objects in art. There is something about that that plays into the same pathways, and that needs to be thought through more and looked at.

Q19 Kerry McCarthy: Thanks, that is very interesting. Tim, can I ask about whether we could do more to use green spaces for food growing, particularly in our urban areas?

Professor Lang: The answer is yes, we could do.

Kerry McCarthy: I thought it might be.

Professor Lang: I listened to the question and gave the answer. I do agree with that. I will go back to Frank Kelly's point and try to link Kate Jones, myself and Frank. One fifth of all lorry use in Britain is food. A lot of it is empty. The food industry, criticised by me many years ago about



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food miles, has done a lot of work to try to fill those backloads. The reason I am raising that about lorries and the pollution that Frank was raising is because, although I know your question is about the urban, I want to make the connection between the urban and the rural. One of the big things that comes out of Covid-19 is the reassertion of the importance of community, the reassertion of the local, and the sensitivity, delicacy and, indeed, sometimes the parasitism of long-distance foods. It is out of sight. You do not have a clue where it has come from; you do not know what the labour process is; you cannot see the pesticides that have been thrown all over it; you cannot see the labour conditions of the workers who are picking it, and so on. Shorter trade routes is a pretty important principle, and it is a good ecological principle. Diversity, shorter and more immediate means less energy. It literally becomes the airways that Frank was talking about. I would say the urban/rural connection is very important.

Then to specifically answer your question about the urban, one of the critical things that has been thrown up, and this is why I was critical of the Government closing down food services, is because it made us all go to supermarkets, going further. Restaurants are very often in locations where people are. There is a class gradient to where they are, of course. We want diversity, and a key principle the Committee could consider is this: is a good food system where people go to the food or where the food comes to the people? At the moment we are doing both, which makes it highly energy expending and makes it hard for us to do. If you go back to Frank Kelly's point about roads, for me a good food system in road terms is one where people take exercise, burning off the energy of the food while going to get the food, and where the streets are safe for them to do it, where children can bicycle to a shop. I am sufficiently old to remember being able to bike to a shop. What child in Britain today is allowed by their parents to bike to a shop? That could be a very simple social indicator of a good urban food system.

I want to come back to your point about allotments. I think we do need more allotments. I am a great fan of the Food for Life scheme of the Soil Association and Garden Organic. I am the president of Garden Organic, the organic gardeners. All the gardening organisations have tried to work on children and growing, from schools up. We have a long-term cultural task of education, but in the short term a critical issue is about restructuring how food is delivered in cities and how people get to the shop or do not.

The final point I will throw in about the urban is that this is one of the trickiest things. It goes beyond this Committee's remit. It is much more for the DEFRA, International Trade and Treasury Select Committees. On the issue of food labour, food is the biggest employer in Britain, about 4 million people. About an eighth of them work on the land. There is a critical issue being thrown out about seasonal labour for picking produce and crops, which has been rightly well rehearsed. We have to address that in the medium and long term. We have to train and educate. We



must enable constituencies like yours, Kerry, and indeed many of you, to be urban people who are entirely familiar with going and working in the countryside. We have to dust down some very old ideas about seasonal work and paying it well, making sure it is good so that you have a seasonal but skilled labour force that does not require us to jet in low-paid workers, where you are using other countries' skills. I speak as an ex-farmer who has cropped. Picking food is hard work, but it is also skilled work. My goodness, if you go to the Lincolnshire fields and see the speed with which people work and also the hard work of it, we have to sort this out. I am back to my urban/rural connection.

Chair: Thank you very much, Tim. We will see how the Government's Pick For Britain scheme works and how many people take up that opportunity, as you suggest, Tim.

I thank our first panel very much for their excellent contributions: Professor Kate Jones, Professor Tim Lang and Professor Frank Kelly. We note that you have all been in print on the various topics that you have been talking about, and some of us will be able to go out, I am sure, and purchase them to the extent that they are not submitted to the Committee as written evidence. Thank you all very much. That is the end of panel 1.

Examination of witnesses

Witnesses: Christiana Figueres, Professor Hepburn and Steve Waygood.

Q20 **Chair:** Welcome to our witnesses on the second panel, which is exploring the connections between the pandemic and the impact it has had on energy use, carbon emissions and clean technology investment.

We are very pleased to have with us a distinguished group of panellists, in particular Christiana Figueres, who has joined us from Costa Rica. Welcome, Christiana. You are the former executive secretary of the United Nations Framework Convention on Climate Change and were instrumental in the Paris Agreement and the previous COP. You are very welcome. Also Professor Cameron Hepburn from the Oxford Smith School, and Mr Steve Waygood, the chief responsible investment officer from Aviva. I will just ask you to introduce yourselves for the cameras before we start with my first question.

Christiana Figueres: Good morning and good afternoon. Good morning to me, good afternoon to you. I am a Costa Rican citizen. I am speaking to you from Costa Rica, and I am definitely in the minority of people who have the huge honour—thank you very much for the honour—to address the Committee as a non-Brit. I am delighted to be in the conversation today.

Professor Hepburn: I am Cameron Hepburn. I am professor of environmental economics and director of the Smith School of Enterprise and the Environment. Thank you very much for the invitation, and I look forward to discussing it with you.



Steve Waygood: Good afternoon. Thank you very much indeed for the invitation to address this Committee. My name is Steve Waygood, and I am the chief responsible investment officer at Aviva Investors. As the fund manager for a very large insurance business, we are as concerned as Christiana is about the climate issue.

Q21 **Chair:** Thank you very much. I apologise to all of you that we have overrun a little with our first panel. If you are okay to stay with us, we will try to conclude this panel within an hour. We have a number of questions for you all.

I am going to start with you, Christiana. We have all been struck by the extraordinary reduction in emissions we have seen around the world, and particularly in the UK, during the course of this crisis. The consequent economic impact of the measures taken to restrict movement all around the world, again particularly in the UK, is going to have some stark short-term and potentially significant long-term consequences. Are you able to put into context for us some of the reductions in energy demand and the consequent improvements in things like air quality that we were hearing about in the first panel—which you may or may not have caught—and give us your impressions about what lasting impact that may have, if Governments react appropriately, as we move towards an economic recovery?

Christiana Figueres: The latest data that we have from the International Energy Agency predicts that this year, globally, we will have an 8% drop in greenhouse gas emissions. That is unprecedented, and I am sure you know that the word “unprecedented” has been used more times than ever before in the past two months because all the data that is coming in is showing that we are in unprecedented times. A drop of 8% in one year has never been done.

Interestingly, where is it coming from? As has already been discussed in the previous panel, most of it is coming from the fact that we have severely reduced air travel, we have severely reduced land travel and we have severely reduced all types of manufacturing and industry. That is where the drop is coming from, and it shows that much of that economic activity is still fossil fuel based. While it is good news that we are dropping in emissions, the bad news is that the 8% drop is because there is still a very strong fossil motor behind that economic activity in most parts of the world.

That 8% is, coincidentally, pretty close to the annualised drop that we need to achieve if we are to get to where science tells us we need to go with greenhouse gas emissions, which is ultimately to a 50% reduction by 2030. If you walk that back, that is an annualised 7.6% per year. From one perspective you could say, “Great job, we already achieved it. It is only May, and we have already achieved the reduction that we should this year.” Sadly, that is the wrong conclusion because, first, that drop is circumstantial, it is temporary, it is chaotic and it has come at huge human cost of lives and livelihoods. None of that is even remotely



similar to the decarbonisation characteristics that we all want when we address climate change. What we want is not a paralysis of the economy but a decarbonisation of the economy. One that is not circumstantial, but rather one that is planned, is smooth, is gradual and is consistent and sustained over time, not temporary. Above all, what we want is a decarbonised economy that contributes to the quality of life of human beings and to the resilience of nature, rather than to human suffering.

Yes, if you only look at the numbers, we can celebrate, but if you look under the hood of those numbers, it is nothing to be celebrated. It is in fact something that we should take very seriously and change as we come out of the health crisis and look into the recovery packages. Chair, I do have something to say about the recovery packages, but I can hold that until that question.

Chair: I think we will be coming on to that. Thank you very much. I should have said that we are very grateful to you for getting up early this morning to listen to the previous session. I know it is before 9 am in Costa Rica.

Professor Hepburn, would you like to comment in answer to the same question?

Professor Hepburn: Christiana is, of course, absolutely right that an 8% annualised fall is both unprecedented and nothing to celebrate. One way of understanding this from a scientific perspective is that an 8% decline—the jury is out, and it could be anywhere between 5% and 10%, but whatever it is—needs to get to zero because we are still adding greenhouse gas emissions to the atmospheric stock, because this is a stock problem, at a rate of over 90% of what it was before. To put it another way, if the stock of heat in the atmosphere is like the level of water in a bath, we need to turn the tap off 100%. Unfortunately, as a by-product of this pandemic, we have turned it off by 5% to 10%.

I think the long-run consequences have nothing to do with this 5% or 10% cut in emissions. They have everything to do with how we respond to it, what sorts of investments are made, how the trillions are spent globally in the coming one to six to 12 months, and whether any of the behavioural shifts and the shifts in our understanding of our relationship with nature last in the years to come.

Chair: We are going to come on to a number of those issues. Thank you very much for those introductory remarks.

Q22 **Sir Christopher Chope:** Can I just follow up the last point? Atmospheric levels of CO₂ are continuing to increase significantly, as has just been admitted. The public are going to be very, very depressed, aren't they, at the thought that despite all this pain, if we had this pain repeated year after year after year and intensified, we still would not be dealing with the problem of atmospheric levels of CO₂? We would still be adding to those atmospheric levels. Don't you see that one of the consequences of the increased public realisation of this might well be that people will say



that the pain associated with the agenda to try to get to net zero is so great that it would be better to concentrate our resources, which are increasingly under pressure, on trying to adapt to the inevitability that we are not going to be able to reduce atmospheric levels of CO₂?

Christiana Figueres: It is a very important question. Let me start with the adaptation piece. Should we not respond to climate change, we will not be able to adapt to the level of destruction and pain that will be brought upon us. It is all well and good to try to think about adaptation, but humanity will simply not have the adaptation capacity and the bandwidth to be able to do that. If we do not address climate change, we are literally looking at an existential threat to humanity—not a wellbeing threat, which is where we are right now, but an existential threat.

To the first part of your question, which I think is the most important part, I completely agree, and that is why it is so important to differentiate this 8% drop in emissions from what we really mean when we are addressing climate change. To address climate change, we are not intending at all to paralyse the economy. Quite the contrary, we are looking to make the economy much more efficient. We are looking to make it much more carbon efficient, much more energy efficient. We are looking to vastly improve the quality of life in cities, where you will have cleaner air, better transport, much better insulated homes that give you a better living condition at home, where large areas of the city are built and used for pedestrians and not for cars. We are looking to improve agriculture, because we can move toward much less carbon intensive agriculture that will have much better agricultural yield, et cetera.

We can go down a long list of areas of human endeavour that will be improved, but this is the moment in which we have to be able to separate what is an unfortunate, unintended consequence of economic paralysis and what we actually mean by decarbonising the economy, which has many positive benefits for health and wellbeing in urban areas, in rural areas, in industrialised countries and in developing countries. Those two need to be very clearly separated in the messaging that we take forward to the public so that there is no confusion because, as you have rightly pointed out, we are in danger of it being confused.

Q23 **Sir Christopher Chope:** Obviously, the issue of aviation and air travel is an example of what you are talking about, but a lot of people who are concerned about CO₂ emissions are saying that a situation where there is virtually no air travel is ideal and is a necessity if we are going to be able to deliver the reduced emissions so that we have an impact on the total amount of CO₂ in the atmosphere.

Christiana Figueres: Yes, but any categorical statement like that is, by definition, a little bit questionable because I do not think we will go back to any kind of economic activity with absolutely no air travel. The fact is that we probably will reduce air travel because many people will decide that they do not want to travel three times around the planet to go to a meeting of one hour or even four hours. We are all getting much more



conversant with the kind of meeting we are enjoying right now, and I think many people, certainly in the business world, will choose to participate in a virtual way rather than travel.

A reduction in air travel does not mean the disappearance of air travel, so I think it will be much more a choice of users of air travel that will reduce, but certainly not eliminate, air travel. I do not think that that is realistic. Even if it were, let us just put it into quantitative context. The fact is that all transport, air travel and maritime transport, and all international travel, both air and maritime, make up only 5% of greenhouse gas emissions. Even if we were to foolishly cancel all air travel and all maritime travel, we would shave off only 5% of our yearly greenhouse gas emissions. There again, we need to be quite careful with those categorical statements that we are hearing.

Q24 Sir Christopher Chope: You are painting a very pessimistic picture, but on the same theme of the behavioural consequences that are likely to flow from the crisis, can I ask Mr Waygood whether he thinks this will have an effect upon the competitiveness of low-carbon investments?

Steve Waygood: Can I start by supporting everything Christiana Figueres said to you in her response just now? It would be a profound shame if we were to associate the current restrictions on people's liberty with the kind of scenario that we need to paint for a just transition, one that harnesses global growth in a way that decouples growth from the fossil fuel machine that I heard Christiana refer to earlier.

You referred to the oil price, Sir Christopher, and we have already heard that come up in this session so far. The oil price obviously has a huge number of factors going on at the moment. We have a supply shock from the OPEC situation, where we have Russia and Saudi Arabia effectively having a price war. We have a demand shock. The machines, the air travel, the land travel, et cetera, that have been referred to are reducing global demand, which has massively increased volatility. There has been a lot of coverage about the reduction in the price, but in the last few weeks we have seen that price bouncing back up again from a low of \$16 to \$17 a barrel to nearer \$40—we are at \$35 today. If you look back over the last five decades, the consistent picture that the oil price paints is one of volatility, and that volatility is now harming the fossil fuel investment case.

We now have well over \$100 trillion-worth of investment capital backing initiatives like the Principles for Responsible Investment and the Carbon Action 100+ group, and taking action and engaging with the companies to encourage them to embark upon a transition. They do so—we do so, as we are a member of that group—knowing that the renewables industry will have lower volatility going forward. It is exposed to less transition risk. It should be supported by the policy environment and, as technology shifts in the direction that we need in order to underscore and support the Paris Agreement, we should see the margins expand.



It is less about the oil price volatility that we have seen in recent months. It is much more about the margins made in the industry, and those margins have been collapsing over recent decades in fossil fuels but expanding in the renewables space. Of course, there is this interplay that the cheaper the price of oil, the harder it is for the oil and gas sector to invest in new technology. That might be renewables, but it is also harder for them to invest in oil shale. That can be supportive of a carbon cut. Conversely, the higher the price, the more it drives further extraction in Canada, which of course can be bad if it is oil shale, bad for carbon emissions.

There are now so many more investors who are conversant in climate as a problem, and insurance companies like mine that are deeply worried about the existential crisis that Christiana Figueres referred to, that I think capitalism itself is waking up to the future crisis of climate change.

Chair: I am sure we will come on to this in our questions, but I think it would be very helpful in some of the responses if you could give us a sense of whether this global pandemic crisis is a portent of a much bigger, more enduring crisis, because hopefully we will find solutions to the pandemic within weeks, months or a short number of years, whereas the global climate crisis could last for a lifetime or hundreds of years. I think putting it in that context would be helpful.

Q25 **Nadia Whittome:** Professor Hepburn, some people are talking about the parallels between the Covid-19 crisis and the response to the 2008 global financial crash. How do you think our response to this crisis needs to differ? What could be done better?

Professor Hepburn: It is a good question. If I may start with some of the similarities and then move to the differences, the similarities in any potential recession or depression are that you need to get confidence restored and economic activity restored. You need to provide a vision of the future that enables investment and jobs to be created. If you are deep in a recession or depression, with apologies to Keynes, even digging a hole and filling it back in again is a sensible proposition to get economic activity going. One of the things that our research has been showing in the course of the last month or so is that digging a hole, planting a tree and filling it back in again turns out to be a more productive set of activities, and to deliver the stimulus benefits as well.

You asked about the differences. The shocks from the financial crisis of 2008-09 were concentrated in one sector, at least initially. Here we have a global, much deeper economic effect on both the supply and the demand side. In 2008-09 we wanted to stimulate economic activity very quickly. Here, of course, we are deliberately destimulating economic activity. We are shutting down economic activity because we are prioritising health.

There is a question in the current crisis about how we phase economic activity back in, and how we do it in a flexible and socially distanced way,



but as the Chair rightly pointed out, we also need to be thinking structurally. We want to get the economy going in the short run, but we want to do it in a way that delivers investment to position us well for the long-run trends, whether they are in mechanisation, robotics, AI, or in dealing with climate change. Some of our work has been looking at the potential for the climate challenge to help us solve the immediate challenge of recovering the economy.

Q26 Nadia Whittome: That is very helpful. In light of that, what areas would you recommend Government target stimulus spending in to generate not just economic benefits but also the maximum environmental benefits?

Professor Hepburn: If you start as an economist, as I am, what you are looking for are interventions or policy spending that will deliver maximum short-run economic multipliers. What that means is, for a dollar of spending, how many dollars of national income you get back. In the short run, you get the maximum economic multiplier from creating jobs; in the long run, you get the maximum economic multiplier from not creating jobs. You want labour intensity now, and once you are back towards full employment the last thing you want is to have a whole lot of people needing to do things that they do not want to be doing. You want it to happen relatively quickly.

We had a look in a paper published a couple of weeks ago at several hundred different policies post-financial crisis. We collected them into 25 archetypes and asked over 230 officials from ministries of finance and central banks, et cetera, their views as to which of these policies met sensible economic criteria. To your point about the environment, it turns out that many of the sorts of things that we have just been talking about in this panel and the previous panel are win-wins, as Kate was referring to. They are policies that drive the sorts of changes that improve our health and improve the environment, but they also improve economic activity because they are labour intensive right now. To give you a classic example, renewable energy investment requires more people upfront to build the kit, per gigawatt of electricity delivered, than fossil. In economic terms that is normally not a good thing, because it means you have additional cost, but when you are in the middle of a recession it is exactly what you want, lots of jobs. The beauty of renewable energy is that, once you have built it, the operational and maintenance costs are so low—the fuel costs are obviously zero—that you have a stronger, larger economic stimulus from that sort of investment.

There are a number of policies that emerge that tick both boxes, that are win-wins, and I will give you a quick top five. It is the transformation of the energy system; it is retraining of workers so that they have the skills appropriate for a different economy; it is clean energy research and development, which is not as quick as some of the other policies; it is working on rehabilitating and restoring natural capital and natural infrastructure; and, finally, it is making sure that our homes and our



buildings are sensibly designed and insulated, and so on. Among many policies, they are the top five that I would highlight.

Q27 **Nadia Whittome:** That is extremely helpful. My final question is for Christiana Figueres. What are your views on attaching sustainability conditions to Government bailouts for high-polluting industries such as airlines, for example? What do you think are the opportunities here?

Christiana Figueres: You have put your finger on probably the most important issue as we move slowly and prudently out of the health crisis and move on to the next crisis, which is the economic crisis. In full view of the fact that the next wave coming upon us is the climate crisis, we have to see these as going from one to the other. Assuming that we are prudently successful in coming out of the health crisis, as countries individually get to that point they will be moving into the stimulus and rescue packages that will attempt to recover the economy. It is going to be very dangerous if the only purpose of those stimulus packages is to recover the economy to where we were in December 2019, for two reasons.

The first is the scale. We already know that an approximately US\$15 trillion fresh injection is being put into the economy, and it will likely go up to US\$20 trillion. At that scale, compared with anything that is done on addressing climate change, such as the nationally determined contributions that countries are working on as their contribution to the climate issue, the US\$10 trillion to US\$20 trillion that comes in through rescue packages is going to absolutely and dramatically dwarf anything that would be done by all countries via the avenue of nationally determined contributions on climate change—completely dwarfs it. The scale of the injection of this fresh money is going to completely overwhelm and overpower anything that is being done only from a climate perspective.

The second factor that needs to be kept in mind here is the critical timing; not only the scale but the timing. The timing is very critical. Those rescue packages, US\$10 trillion to US\$20 trillion, will not only be defined but very likely allotted over the next 18 months. Because of the scale, they will determine the characteristics of national economies and of the global economy for several decades.

It is exactly this decade, between 2020 and 2030, where climate science has been lucidly clear that we need to halve our emissions, reduce to 50% the emissions that we have right now. You can see that there is a collision of crises here in terms of the timing. Because the money for recovery will go into the economy now, it will dwarf anything that we want to do separately on climate change and it will either lock in a high carbon economy for decades to come or, if it is done properly, it can accelerate a low carbon, high resilience and high job creation economy, as has just been mentioned by Cameron.



That is both the responsibility and the opportunity that is staring us in the face right now. A mistake here could be incredibly costly because Governments will not be able—after they have indebted themselves to the degree that they will for economic recovery over the next 18 months—to inject any new capital sources for climate change after that. Even if they did, we would already have thrown the die on the table and we will have determined the carbon intensity of the economy, both nationally and globally.

The characteristics of the recovery packages are absolutely key, whether it is airlines—which was your question—or whether it is energy generation, whether it is building the built environment, whether it is agriculture. Across the board, one of the very key factors that needs to be centrally considered as these bailouts, recovery packages and stimulus packages move forward is the carbon efficiency that that injection will lead to. Is it going to make us more carbon efficient? If yes, that is a green light. If it is going to make us more carbon inefficient and thereby exacerbate the next crisis, which we will not be able to avoid—an order of magnitude worse than what we are living through right now—then that should be a red light. It is a simple binary choice. Does it lead to lower carbon and higher resilience or not? It is a pretty simple choice, and it is the only prudent and wise choice to be made.

Q28 Mr Robert Goodwill: My question is for Christiana Figueres. It is internationally recognised that, as the architect of the 2015 Paris Agreement, you succeeded in bringing countries together and getting member states, nations, around the world to realise there are some problems that can be addressed only if we work together internationally. My question is about whether the experience of the current Covid-19 situation will have a bearing on that. We have seen scientists around the planet realise that co-operation is important but, politically, nations around the world are becoming much more entrenched. Even within the European Union, where member states are used to co-operating together, or between the US states, we have not seen that level of co-operation. How could this current crisis impact negotiations at COP26 and the wider efforts to address climate change and biodiversity loss?

Christiana Figueres: That is a very important reading of the dual politics that we are facing right now. Thank you for that question. Let me start with an important clarification, which is that COP26, whenever that happens—it will happen not this year but next year, perhaps in the autumn—is not a negotiation such as we had in Paris. There is practically nothing left to negotiate. There is one issue, which is the price on carbon, but other than that COP26 has much more of the characteristics of a check-up than of a multilateral negotiation. Think of it as all of us filing into the doctor's office to report to him on how we are doing with our health improvement. That is the characteristic we will have for COP26, where each of the 195 countries will have to march into Glasgow and report on how they are doing with their climate commitments. This, of course, will be incredibly facilitated and enabled if this year we are able



to green all of the recovery packages, as discussed before. The heavy lifting on COP26, interestingly enough, needs to be done this year in the midst of this financial recovery.

Let me touch upon the second part of your question, which is equally important. It is very clear that the first phase of this health crisis has led the entire world to an acute isolationist mentality because the health professionals have told us quite clearly that the best way for each individual to help is, "Lock yourselves up in your home and do not come out." That exercises the isolationist part of your brain and your activities. We now have half the world exercising that isolationist muscle, with good results because those countries that are much more stringent about the isolation measures coming down from their Government are doing better than those that are not taking it so seriously. One could say that what is happening here is a conscious or unconscious strengthening of the isolationist approach to global issues. That is only partially true because it represents the first stage of the health crisis.

Once we get to the second stage of the health crisis, which is the development of a vaccine, the manufacturing of a vaccine, the distribution of a vaccine and the reduction in cost of that vaccine, it cannot be done with an isolationist approach. None of us, as individuals, is safe from this virus as long as some of us are still susceptible to the virus. We know that the only way to truly come out of this health crisis—and it will take several years, as discussed by the previous panel—is to be able to develop a universally accessible vaccine, accessible both geographically and financially. That is not going to be done by any single country. Not going to be done. It has to be done as a multilateral effort.

There will be some countries or one country, or two or three, that first successfully develop a vaccine from a medical point of view, but that is not the end of this story. Then it needs to be manufactured in order to vaccinate 7 billion humans on this planet. It needs to be distributed. It needs to go to the scale and volume that brings the cost down. It needs to be provided to every single human being. By definition, coming out of the health crisis is going to have to be the result of collaboration and of multilateral efforts.

That is not very evident right now, because we are all locked into our homes, but it is the only way to be able to safely open the doors of our homes and our offices. It remains to be seen whether we humans, in our infinite wisdom and infinite capacity to learn and to remember, will take the lesson to heart that, yes, there is a moment and a place for isolationist actions and behaviours, but that that cannot be the end of the story. Possibly all global pandemics have to have a major component: in order to be solved, they have to have a major collaborative, co-operative, multilateral and multinational effort.

Q29 Mr Robert Goodwill: It remains to be seen how that will pan out. For example, if the UK were the first country to develop a vaccine and we



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have 60 million doses, would we vaccinate just the vulnerable people in the UK and then share it with the world, or would we insist on vaccinating everybody in our country before we shared that technology further afield?

Moving on to the UK's agenda at Glasgow, I know that 100 countries around the world have already in effect told their doctor that they have improved by publishing enhanced NDCs, nationally determined contributions. Alok Sharma, our Business Secretary, said that we will publish ours well ahead of COP26. When would you suggest he should do that, and would that set a good example to other countries around the world?

Christiana Figueres: Yes, it definitely will set a very good example to other countries. I believe the UK should do it as soon as they responsibly can. There is no use in going forward with something that would have to be corrected later, so as soon as the numbers have been checked and calibrated for the new reality. That will obviously be a very important example to set for the world. Beyond that, it is not just about the unilateral. All other countries, except the UK, have a unilateral responsibility to COP26, but the UK has both its national as well as its multilateral responsibility as presidency of the COP. Secretary of State Sharma has a huge responsibility to be able to mobilise all other countries toward these much better recovery packages this year. The diplomacy of COP26 needs to do the heavy lifting this year. Next year is going to be too late, and there are several very specific political levers that the UK can use to do the heavy-lifting diplomacy that needs to be done.

The first, I would argue, is the Coalition of Finance Ministers for Climate Action, which comprises more or less 40 countries. It is presided by Finland and Chile, both of which are very committed to greening their economies. It was created before Covid-19, but now it proves itself to be probably the most critical group of Ministers who can move the needle. These are Finance Ministers who understand the financial impact and the economic impact of climate change. It is 40 countries, most of them mid and small-size countries. I would say that the task to be performed there is to get the larger economies. I do not know if joining the coalition would be ideal, but at least to have the same understanding as these 40 Finance Ministers of the importance of greening the recovery packages. Secretary of State Sharma can play an important role there, but obviously it also requires the participation of the Exchequer. Diplomacy for COP26 is going to have to be an all-Government approach.

The second very interesting lever open to the UK is CHOGM. There you will have a very unusual—historically understandable, but unusual from the geopolitics of today's reality—group of countries that can be convened by the UK, by the Foreign Office in this case, and it can be a very important group of countries to move forward into greening the recovery from Covid this year.



The third political lever, I would argue, is G20, which has already started, surprisingly, to walk down this path, presided by Saudi Arabia. One might think that is a hopeless case. It is not hopeless. They are very aware of the fact that they need to diversify their economy. A concerted effort with Saudi Arabia on the part of the UK would be very useful for the UK. Then, of course, we turn to the permanent multilateral institutions, such as the IMF. The IMF is huge ally of the UK in the job that needs to be done at COP26, with Kristalina Georgieva already having come out very clearly with her position that, yes, the IMF is going to help countries but that it has to be green and inclusive.

The IEA is the other multilateral organisation that can be a huge ally to Secretary of State Sharma. Fatih Birol, the head of the IEA, was the first to come out and say, already two months ago, that the only way to get out of the Covid economic crisis is to green energy. That is very unusual for the IEA because they usually take the side of fossil fuels, but this is a very unusual stand and one that should be taken advantage of. Then, of course, there is the OECD. Those are my top three multilateral institutions that are standing ready to support the UK in its admittedly very challenging diplomatic effort for COP26.

Q30 Alex Sobel: I have changed my question three times because Christiana's evidence was so fascinating and useful. Taking into account the fact that, through this crisis, we have had huge state financing, with finance passing from the public to the private sector—including the heavily polluting industries that prop them up—going into next year, with the UK as the president of COP and Italy running the pre-COP, and at the same time the UK is going to be president of the G7 and, after Saudi Arabia, Italy is going to be president of the G20, how can the UK, working with the Italians, use our global leadership on climate and finance to lead a recovery on both economies and climate?

Professor Hepburn: I highlight some of the things Christiana has mentioned. The UK retains very strong ties with the US and with China. They are both key players, and they are both members of the G7 and the G20. The US is, of course, in a slightly tricky situation right now for various reasons, which I am sure many of you understand, and my friends over in Washington suggest there is going to be only incidental action, at least until next year, if we get a new President.

The Chinese are in a rather different situation. I would highlight them as an absolutely key lever, to add to Christiana's, because they are currently in the midst of the five-year planning process. I spent several hours yesterday with them and others on this. There is willingness, interest and a recognition of the necessity of greening the recovery in China. It is also very important because they are coming out first from the virus. They will probably recover first, and what they do is likely to set an example for other countries. They are also very eager for economic financial analysis as well as environmental analysis, especially the former, on how to recover. The UK can and should, and actually is leveraging its



relationships with China both bilaterally and through those organisations to make sure that we get a sensible five-year plan.

It is unusual. Because of the five-year planning process, there is an awesome amount to play for as any one of these is locked in. As Christiana has mentioned, this is now true across the world because we are locking in the next five years, if not more, in the spending that we are about to deliver into our economies, but China is a particular leader, so I highlight it.

Q31 Mr Shailesh Vara: This is a brief question, and perhaps Professor Hepburn could continue with a response. As we eventually emerge from this global crisis, the fact is that some of the less developed countries will be in a much worse position, relatively speaking, compared with the western countries. The priority of the less developed countries, their leadership, will be where to get the next meal for tens of millions of their citizens. When that is their priority, what can you say to them in terms of trying to give priority to the bigger environmental picture?

Professor Hepburn: I would say that of course their priority is to get the next meal to their citizens. It turns out that a good way of getting the next meal to people is not to do it in a high carbon way, but to do it in an efficient way. Similarly, their priority will be to create jobs. There is horrific unemployment, as I am sure you are aware. India already has over 100 million people unemployed. These are huge humanitarian and human problems that come first. One of the points of our paper is that there is not necessarily a trade-off between addressing these vital issues and putting economies and countries on a resilient pathway to the future.

For instance, do you want to create jobs in an industry that is insecure, highly volatile—as Steve has mentioned—and where the jobs are just as likely to go as the capital assets? Equally, where you have renewable energy now, I am sure some of you will have seen another incredible record pricing at \$1.35 for solar PV in Abu Dhabi; this is incredibly cheap. If you want cheaper electrification of your economies, you do not go fossil anymore, you go renewable, and helpfully it is labour intensive.

The place to start is not to assert the primacy of environmental considerations over these other considerations, because that is simply incorrect. You are absolutely right that we have to focus on food provision, shelter provision and the basic needs. We must understand that there is an alignment between these basic requirements and the requirements of the transition to a sustainable future.

Q32 Jerome Mayhew: I am going to focus my questions to Steve Waygood, if I may. I start by highlighting the importance of resilience and local community roots, which we heard about earlier. As a Norfolk MP, I turn straight to your company's name. Can you consider renaming yourselves Norwich Union? I am sure it would go down a lot better in this country.

Going on to a wider point, the Covid crisis has obviously wreaked havoc



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in the financial markets over the last few months. I would like to stretch that away from Covid and apply the same principles to the risk we are facing with climate change. From your perspective as an insurer, if climate change goes above the 1.5 to 2 degrees that international agreements aim to limit us to, what could that pose to our financial stability?

Steve Waygood: The second was an excellent question. We have been hugely concerned about this issue of financial stability and the interrelationship with climate change for many years. We first started engaging with the Bank of England back in 2012 before Mark Carney took on the helm as Governor. Mervyn King also engaged with this, and I am sure Andrew Bailey will, too. We sponsored a study by Vivid Economics, a group that came up in the previous panel. Vivid Economics worked with the Economist Intelligence Unit. They calibrated the value of risk, so we modelled out to the end of the century. We imagined different scenarios of climate change: 6 degrees was the worst one that was modelled. It is plausible but incredibly unlikely, and in terms of predictable, black swan events it is still worth looking at.

The present value in 2015 was negative, that \$43 trillion would be wiped off the global stock of capital. At the time that was a third of the stock of manageable capital. There are various other studies. It would be absurd to say that that figure is precisely right, but it is certainly broadly right; it is probably precisely wrong. So \$43 trillion is the scale of the risk. The work we are doing now was catalysed by Mark Carney. I am on the Financial Stability Board's Task Force on Climate-related Financial Disclosures, and the FSB is taking action, but the action it is taking is weak in various respects. I say that as a member of the committee.

First, it is weak because it is only guidance; it is not mandated. The UK has an opportunity, which it looks to be about to take, to make it a requirement for listed businesses to produce a TCFD report. It has said it will make that a requirement for pension schemes. We also need to think about more than just this thermometer, which is what the TCFD is. The taskforce reports are looking at physical risk, transition risk and mitigation risk. Those are just risk measures. We need to reduce the heat that is currently warming the system. The way we do that is by turning down or retuning the fossil motor that Christiana referred to in her evidence.

We also need to do two big things. First, we need to make it pay for companies to deliver the Paris Agreement. At the moment it unfortunately pays them to continue to destroy it. The embodied global warming potential of the London Stock Exchange is nearer 4 degrees than 1.5. This is a profound problem if you are an insurance company. We are exposed to the physical risks of floods and fire. Others will insure more than we do in terms of food. We are not a big insurer in that space, but of course famine will be a problem. We do general insurance though. As we near 4 degrees, we believe that represents an existential crisis for



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our sector, and that is currently where the London Stock Exchange is heading.

We need to recalibrate by, as you would put it, internalising the externalities. We need to ensure that we have fiscal measures, market mechanisms, standards and directives that internalise the costs of carbon at source. In addition to mandating TCFD, we need to commission with the G7, which of course is hosted by the UK next year, as well as COP26. We need to invite the IFRS, the trustees of the International Accounting Standards Framework, to take the guidance that TCFD has produced and not just make it mandatory in the UK. They could make it part of the international guidance system, but they need to be invited to do so. It needs to be a mandate conferred upon them, and the G7 could do that. A specific recommendation I would make from a policy perspective is to ask, via the G7, the IFRS trustees to take the TCFD and embed it into the International Accounting Standards Framework.

My final recommendation to restabilise these profoundly negative potential consequences of climate change for the financial system is to add one more to Christiana's list of COP26 policy levers. We have a group of central bank governors, the Network for Greening the Financial System. They have been inspired by the Bank of England and the leadership of Mark Carney to work in this space, and we need to rethink the multilateral system right now. We lack a platform where multilateralists meet capitalists and ensure that we use the capital we have, approaching \$400 trillion, that sits in the global system. We do not yet have a mechanism that harnesses that capital in a consistent way and puts it to work in the areas of technology and other types of energy-efficient solutions that are required.

We need to add to the nationally determined contributions that have been mentioned a few times. We need to add a capital-raising plan at the national level that is then co-ordinated by perhaps some kind of international platform for climate finance, bringing the IMF, the World Bank and the UN together with all the systemically important banks and the systemically important financial institutions, like Aviva itself. We stand ready to put capital on the table, but we need a mechanism to help that flow that is fit for purpose. The flow of capital that is required is four times the Marshall plan plus the Apollo programme combined each year in real terms.

Those two initiatives, Marshall and Apollo, were donations. They were Government-funded through bonds. What we are looking for here is invested capital that will make a return; that is the biggest difference. That is why we can now harness the markets. But with the best will in the world, the UN Framework Convention on Climate Change is not populated by bank analysts and individuals who understand financial markets well enough. We need to create a public good investment bank that brings together these multilateralists and capitalists in a way that finances that transition and delivers the Paris Agreement.



Q33 **Jerome Mayhew:** What movement is there on that last point? Is there global movement towards creating the kind of structure you are advocating, or are you whistling in the wind at the moment?

Steve Waygood: We are whistling alongside 30 other organisations. There is a coalition for the creation of an international platform for climate finance. Christiana Figueres was there when the asset-owner initiative, which is looking at ensuring the transition to net zero, convened a group of international leaders in Davos, and this was part of the conversation on that platform. I have personally raised this with colleagues at the UN Framework Convention on Climate Change, at the IPCC and various IMF conversations. At the moment it is an idea on the table. I have had a productive conversation with Mark Carney about it. He has invited further follow-up. It is an idea that we have put on the table, but I am not certain it has yet had serious engagement. We stand ready to help with that serious engagement, but it would be a wonderful thing if it can be a core recommendation that comes out of this group. We need to create that finance plan.

If you are a listed business, you have a capital-raising plan that says how you grow your company. Are you retaining profit? Are you issuing debt? Are you issuing equity? You have a vision from your CFO on how you are going to grow the business. The world misses a CFO, and that is what we are essentially recommending the creation of.

Q34 **Jerome Mayhew:** Leaving it up to individual businesses, even listed businesses, to have their financial disclosure is fine, but it is not attacking the systemic issue of the allocation of capital.

Steve Waygood: Exactly. It is just a better measure. It does not turn down the heat.

Q35 **Jerome Mayhew:** Just to finish off this section, we heard from Christiana earlier that there is a huge likelihood or risk that, as we start for quick economic growth coming out of this crisis, we are going to see companies and investors retreat from environmental, social and governance objectives and prioritise, in the first case, economic survival and then economic recovery. We have heard from Christiana about Government investment in bailout funds but from your perspective, as a private investor who holds huge amounts of reserves in investments, what can be done to ensure that sustainability remains a priority right now?

Steve Waygood: I am aware of the study you are referring to, and what they missed is the importance of governance at the corporate level. Of course, no company is going to suggest that it is going to walk away from governance. Of course, they would all regard their staff and their customers as core. The social side of ESG, and the G side of governance, is massively important. I am sure they are going to be focusing on the coronavirus, and perhaps in response they are thinking of their philanthropy programmes. I think the study was wrongheaded. There is



no question but that ESG funds today have outperformed non-ESG funds. There are any number of citations I can give to substantiate that claim.

To answer your question directly, the conditionality needs to be based on Government support, but any company that receives Government support should, in turn, commit to producing a TCFD report. This is the report that analyses where they should be going. They should also say, on top of that report, "This is our transition plan and how we are going to deliver the Paris Agreement." The TCFD report does not require a transition plan, and there are other conditions that need to be placed upon them in terms of the governance of the business, embedding the delivery of the climate transition in the incentive structure and in board training, and so on. That conditionality needs to be embedded in any Government support. There are other conditions around share buybacks and so on, which of course matter, but in the case of climate change those are the ones that I would suggest.

Chair: We will take you up on that offer, Steve, to provide some examples of how ESG funds are outperforming non-ESG funds.

Q36 **Marco Longhi:** I have just one question for all three witnesses. What would you say is the single most important lesson we need to learn from this crisis in respect of how we approach climate change and sustainable development?

Christiana Figueres: The most important lesson is one that we have to relearn, which is understanding that risks have different characteristics. There is one particular quadrant of risks that are high probability, high impact risks. In that quadrant we have Covid-19 and we definitely have the climate crisis. One lesson that we have to relearn—it is nothing new, but we seem to have a short memory—is that high probability, high impact risks have to be acted on in a timely manner and that delay is very costly.

Steve Waygood: All I would add to what Christiana has already said is the pandemic was predicted in a number of places and in a number of different ways. It was predicted to be a high probability, high impact event. Even the Cambridge Risk Index, published annually, recently highlighted it as one of the very top issues. I have referred already to the World Economic Forum earlier this year, and it was highlighted there.

Learning from the coronavirus situation, where we have these high probability, high impact events, we need to ensure that we have the vaccine. With climate change, we do have the vaccine. We have the technology and a political framework. We also have a treatment, which is the capital being deployed, but the treatment and the vaccine will only work for roughly the next decade. Science has been very clear that we need to stay south of the tipping points. The lesson I would learn from this situation is that this problem has been predicted, and it would be tragic if all the Government attention on the coronavirus response and the prudent process they are taking displaced the equally prudent—perhaps even more important—response on climate change.



Professor Hepburn: It is a very good question, and Christiana and Steve have given the most important response to it, so let me say something different and complementary, if not secondary. The economy, the climate and our health are all inextricably interlinked and rather than, as economists frequently do, look for trade-offs between action on one and action on the other, we will make progress by listening to the science, doing good analysis and finding the areas where there is alignment between action on health, action on climate and action on the economy. The surprisingly good news is that there are significant areas of alignment. Where there is, it is a no-brainer not to be taking that kind of action based on science and taking it early.

Q37 **Chair:** I am going to use the Chair's privilege to ask one final question to each of our panellists. We heard in the previous panel about the lack of an international body that is able to pull together a global response to a health pandemic, which we are now going through. Christiana, you have given us a very good outline of the different global bodies that need to come together to solve the climate crisis. Could you each indicate what is missing from the current picture or constellation of international bodies that could help both with a global pandemic, if you feel you can talk to that, and secondly, with bringing together the response to climate change.

Christiana Figueres: A very important question. Having worked for a very large international organisation, namely the United Nations, I know the difficulties of creating and operating such a huge international organisation. I also know the benefits. My answer to your question is that it is not about a new institution. It is not about a new structure. It is, frankly, the very simple and yet vexing challenge of political will. There is nothing that we have said here—nothing that Cameron has said, nothing that Steve has said and nothing that Christiana has said—that is new to this conversation.

This is something that we have known for a very long time. It should not come as news. It is about understanding that we are facing this unbelievable opportunity not only to align—and I like Cameron's use of that word—the fact that the crises have collided against each other, but to align the solutions, to converge the solutions, because they are so easily converged. It is the only way to get out of them.

Frankly, I do not think we have the time or the patience to create another institutional solution to this. I also do not think that a new institution or structure would guarantee the solution. It is about statesmanship. It is about political will. It is about understanding who we are as human beings in this very moment of human evolution and development, and how we turn up in the world. It is about deciding that, before we leave this planet, we are going to leave a better scenario than what we found before.

Professor Hepburn: I agree with Christiana, but I will add that, in a sense, there is a metaset of institutional approaches that is missing or at



least that we need more of. It is not a new institution, but it is an understanding that the way we make progress here is through flexible architectures—Christiana showed that brilliantly with Paris—coalitions of the willing, clubs, membership organisations, and sometimes laying it on top of the existing institutions so that they work together in somewhat more entrepreneurial and flexible ways. That requires some leadership or some entrepreneurship, probably both. It does not necessarily require a new institution.

Where I am heartened is that you are starting to see much more of this happening, whether it is the Network for Greening the Financial System, a flexible coalition of central banks or whether it is the coalition of Finance Ministers that Christiana referred to. Those sorts of membership organisations or loose clubs are what we need. It would be great to have one around carbon pricing. The one on border adjustments is working well, and there are various others I could suggest.

Q38 Chair: Steve, you were giving us your prescription for some kind of international structure to allocate private capital to help meet climate change. If you have written on that subject, it would be very helpful if you could supply the Committee Clerk with anything you have written. Do you have a prescription in relation to the question that I just asked?

Steve Waygood: I do. We will definitely follow up with the Committee Clerk. We do have material that is written and is being built so we can provide it on an ongoing basis.

I am a big fan of the United Nations, and I think the World Health Organisation at one point had a mandate to do the work that has been referred to in terms of the pandemic. With different support from some of the member states of the UN, it would have been able to do more to deliver the success it had with Ebola. I think the leadership also need to be empowered in a way that they are not.

In relation to the climate situation, I like the way Cameron put it: a meta-organisation. Not a new institution but a flexible mechanism bringing together the existing ecosystem. It is true to say that this is the first time. When the Paris Agreement was signed, we did not have the NGFS. The TCFD, the Task Force on Climate-related Financial Disclosures, was embryonic. It was launched in Paris. This coalition of Finance Ministers has also evolved more recently, and the net-zero asset owner initiative—this group of very large asset owners, including us as well as Allianz and Axa, and so on—did not exist.

This presents COP26 with a unique opportunity to bring together the governors of central banks, Finance Ministers and very large asset owners, all of whom at the very top are saying that they understand the imperative of delivering on the Paris Agreement. I do not think we should be building something that is a new institution embedded within the UN, but something that brings together the IMF, et cetera—I have already articulated the various institutions that should be brought together—and



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something that brings them together in a collaborative space and ensures that there is that symbiosis and, crucially, that they come together with a plan of action. With COP26, the presidency definitely has the legal ability to create that kind of mechanism, and it would be powerful. It would harness markets in a way that they are not being harnessed right now.

Chair: That is a very neat encapsulation of this session. It has been utterly fascinating, and I would particularly like to thank Christiana Figueres for making herself available from across the world. As the architect of the Paris Agreement, we look forward to seeing you at COP26 in Glasgow, if not before when you are passing through London. Thank you, Professor Cameron Hepburn, for joining us from Oxford. I am sure we will be talking to you again. Steve, you have given us some very fascinating insights from a City of London perspective. Thank you to the witnesses. Thank you to Nick Davies and Lydia Franklins, who put together our briefing for the day, and thank you to Lorna for ensuring that the technology worked as well as it could. Thank you all very much indeed for an excellent session.