House of Commons

Business, Energy and Industrial Strategy Committee

Oral evidence: Outcomes of Bonn COP23, HC 597

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Watch the meeting

Members present: Rachel Reeves (Chair), Vernon Coaker, Stephen Kerr, Rachel Maclean, Mark Pawsey, Antoinette Sandbach.

Questions 1 – 39

Witnesses

[I]: Bob Ward, Policy and Communications Director, Grantham Research Institute on Climate Change and the Environment, London School of Economics; Dr Stephen Cornelius, Chief Adviser on Climate Change, WWF-UK; and Zoe Knight, Managing Director, Group Head, HSBC Centre of Sustainable Finance.

Written evidence from witnesses:

– [Add names of witnesses and hyperlink to submissions]

Examination of witnesses

Witnesses: Bob Ward, Dr Stephen Cornelius and Zoe Knight.

Q1 **Chair:** Thank you very much for coming to give evidence to our Committee this morning on COP23. We are pressed for time this morning because of the Budget, so we are going to try to keep our questions as short as possible, but could you assist with your answers as well? We are very keen to hear from you after the negotiations in Bonn for the last couple of weeks. If I could start, I wondered how far you think Bonn has moved forward the implementation of the Paris agreement.

Bob Ward: Bonn basically had two major areas in which it needed to make progress. One was on the so-called Paris rulebook, which is about the implementation of the agreement, and it certainly made progress. It produced a document that is essentially a summary of the views of the countries there. It is a bit long; it is 150 pages or so. It made enough progress that that should be able to be finalised by next December at the next summit in Poland.

The other area in which it needed to make progress and succeeded was the so-called global stocktake, which is due to start in January, called the Talanoa dialogue, using a Fijian word to capture the concept of inclusiveness, collaboration and transparency. The final decision that was eventually reached on Saturday morning includes an outline of that process. That is going to be critical, because that global stocktake is supposed to lead countries to submitting pledges for 2020, where they increase the ambition. It is widely understood that, collectively, national commitments at the moment are not sufficient to realise the overall goals of the Paris agreement.

Q2 **Chair:** In terms of meeting the more ambitious goal of a 1.5 degree increase, how realistic do you think that is? What would it mean in terms of ramping up emission reduction pledges?

Dr Cornelius: Thank you for inviting me this morning. First of all, 1.5 is clearly going to be a challenging target. It was an ambition that came out of the Paris agreement: well below two degrees, and pursuing efforts towards 1.5 degrees. It requires peaking of global emissions before 2020 and rapid decarbonisation across the globe, so across the economy. It will probably need negative emissions, which I heard you talking about earlier, around mid-century. Basically, it requires decarbonisation. The UK pledging to get out of coal is a good example of that.

On your question as to whether Bonn helped that, as Bob said, the objectives of Bonn were mainly technical. They were to set the stage for next year, so the facilitative dialogue—the Talanoa dialogue, looking at what countries have pledged, with the idea of ratcheting those up to make them tougher over time—and the rules. The outcome next year is important, and this is more of a setting of the stage.

Q3 **Chair:** How confident are you, Dr Cornelius, that we will be able to ramp up sufficiently to meet those ambitious targets?

Dr Cornelius: I have been working in climate change for 13 years, and I would not still be doing it if I were not optimistic about things. It is something that we need to do; it is not something that you have to take lightly. Even two degrees is going to be challenging, but the damages that occur at even 1.5 degrees are huge, so we have to put all of our efforts into it.

Zoe Knight: Thank you for the invitation today. I will put on the record that the comments I make this morning are in response to conversations that I have had and work that I have done. They are not an official HSBC view on climate change.

In terms of what COP meant for implementation, it is a very, very strong signal that climate action and climate effort are being maintained on the global agenda, and that was important for investors. In terms of whether we can achieve the 1.5 degree goal and whether we can raise ambition to do so, I see a lot of investor appetite to finance low-carbon initiatives. But there is not enough scale, transparency and disclosure on where they are and how to aggregate those to the scale that is required.

It is a very difficult job indeed to raise ambition to reach 1.5 degrees, but the non-state actor initiative that Paris brought forward around cities, corporate investors, et cetera, is taking on even greater force than the negotiations themselves. The negotiations are important to create that signalling effect, but the groundswell around that has also reached a tipping point of changing momentum.

Q4 **Rachel Maclean:** Obviously, President Trump has created a lot of statements and media headlines with his view of climate change. Do you agree with the maybe somewhat optimistic comments of Christiana Figueres that perhaps he will be a blip in history, and he will not derail progress on this important issue?

Bob Ward: I think this COP passed the Trump test. It was the first meeting since he announced his intention to withdraw from Paris. It is clear, actually, from his June announcement that he does not understand the Paris agreement himself. The fact is that the earliest it could complete withdrawal from the Paris agreement would be 4 November 2020, which is the day after the next US presidential election. However, the negotiators who were there from the United States were Obama-era negotiators. Rex Tillerson has not yet cleared out the State Department entirely, and they were reportedly very constructive in the conversations.

The only real illustration in Bonn of the Trump Administration's approach was a rather farcical side event at which they tried to promote the idea of clean coal. That is clean coal without carbon capture and storage, so not clean at all. It was disrupted by protestors. The mood in Bonn was very much one of determination among the parties that President Trump should not disrupt it. There was also an extremely strong display from American companies, cities and states, led by Jerry Brown and Mike Bloomberg—part of the We Are Still In campaign—making clear that they are going to carry on with implementation of Paris, regardless of what the Federal Government does.

Q5 **Rachel Maclean:** Clearly, we have an election. If he wins a second term, possibly he could withdraw, but would you say that people are continuing on the assumption that that is not going to happen, and that it is not going to derail the world's attempt to reduce greenhouse gases?

Dr Cornelius: After President Trump announced the intent to withdraw in June, a lot of countries reaffirmed their commitment to the Paris agreement. You have seen the We Are Still In initiative from the US. I think, a week later, they had 1,500 businesses, cities and states signed up; there are now 2,500-odd, which, as Bob said, were out in great force in Bonn. Now 170 countries have ratified the Paris agreement—including the US, because, as Bob said, it is still legally part of it at the moment—covering 88% of global emissions. There is definitely a momentum and irreversibility about it, I believe.

I was surprised that there was not more about Trump there. It was going to be the only news story: the first COP after America's intent to withdraw. As Bob said, the negotiators got on and did their job. They led some of the work on the transparency agenda, for example. This was the first COP where the US did not have its own pavilion showcasing the work that it did, but that gap was filled, and the leadership gap was filled, by the US states, cities and businesses.

Zoe Knight: Investors discounted the Trump information after election. Marrakesh was very much, for them, a signal of "What is next after Paris?" At Bonn this year, with Fiji, the thinking has been around "Well, is it still business as usual now that it is withdrawing?", focusing on who the next climate leader will be: whether Europe will maintain its momentum, whether China will step up more and where that country leadership will come from now that the US is not as much part of the talks as previously.

Q6 **Stephen Kerr:** You have already mentioned We Are Still In. What effect did its presence have on the tone of the actual negotiations? What do you think of Michael Bloomberg's argument that We Are Still In would be a bigger economy than any other country in the world, outside of the US and China? Should it have a seat in the negotiations?

Dr Cornelius: I spent 10 years as a UK negotiator, and the UNFCCC is states: member countries. There is the side that states need to make an agreement at national level. On the push and the momentum that you see from the non-state actors—the cities, the businesses, et cetera—they need to tell their elected representatives that they want action. This is the way that they can influence the negotiations.

Q7 **Stephen Kerr:** Were they influencing the negotiations, as things stand?

Dr Cornelius: This negotiation was a technical negotiation that came out with, as Bob said, 150-odd pages: a compilation of the views of all the different parties. Therefore, you could argue, in terms of technical output, no, but in terms of the momentum that Paris is important, yes.

Bob Ward: The UNFCCC process is a consensus process. Everybody has to agree, so nothing is agreed until everything is agreed. There are 197 parties already in that negotiation. The idea of adding some more is not a formula for greater progress; it would probably slow everything down even more.

Q8 **Stephen Kerr:** Who would be the biggest losers, or the biggest winners, from President Trump's decision to exit the agreement?

Dr Cornelius: The winners, I suppose, are those who are competing with America. This is probably more for Zoe. The market momentum in the US and elsewhere is against dirty fossil fuels, coal in particular, and towards renewable power generation. This is a domestic decision, but it is going to be a loser itself. Its competition, which I suppose is China and countries that are developing renewable energies, are likely to win over that.

Q9 **Stephen Kerr:** Do you see China emerging as a leader in this area?

Dr Cornelius: China is one of the leaders in the negotiations, but there are several others.

Q10 **Stephen Kerr:** It is distributed.

Dr Cornelius: Yes. Fiji, for example, and the small islands are pushing the agenda around 1.5 degrees. You have cities and states—although not in the negotiations, as I said—and all the other actors, showcasing the work that they are doing and showing that things are happening outside the negotiations.

Q11 **Stephen Kerr:** Which are the countries that can provide the political momentum, in terms of the tightening of these national targets?

Dr Cornelius: The EU will be important. Hopefully, the UK will also be important. We have a good story to tell. I missed some of the earlier session, but we have done a lot in terms of emissions reductions. We have a long-term target that is not Paris-consistent, but there are things that can happen that the UK can sell. Certainly, the EU, small island developing countries, which are the more vulnerable, and big rising countries such as China will be important.

Zoe Knight: In many ways, the Trump withdrawal means that other regions are getting quite excited about the prospect of being able to take on more of a leadership role. For China in particular, the marrying of the Belt and Road initiative with climate aims and sustainability aims, and wanting to drive the green capital agenda, green financing and green definitions, sits quite nicely in terms of its overall strategic vision and positioning through the 13th five-year plan. There is a push for it to do that among both the corporate and the investor community as well, so that China-EU leadership role is there to be fought out. Whoever can design a good financial system that enables the unlocking of capital for sustainability and climate change initiatives will see capital inflows, so that is important.

Another area to watch, which is bubbling away in the background a little bit, is the Middle East, and what the Middle East does with oil, carbon capture and storage on industrial facilities, and driving emissions through longer-term planning there. It is particularly interesting that the co-chair of the Paris agreement is a Saudi Arabian, Sarah Baashan, combined with New Zealand's Jo Tyndall. It is really interesting how the region has stepped up quite quietly within the talks themselves, and is engaging quite widely on climate issues. You have not really seen that in the past. Trump has not helped with the overall sentiment, but in terms of on-the-ground implementation and how we are going to finance this huge energy system-scale transformation, people are looking elsewhere.

Q12 **Stephen Kerr:** Do you think that the US could accrue to itself some competitive advantage from withdrawing, to the detriment, for example, of the UK or international business in general?

Zoe Knight: Only potentially at a very local level, not in terms of global trade flows. We all know that the economics of renewables and of clean have changed so significantly that they make sense, with California taking the lead and linking up with Canadian provinces through carbon pricing mechanisms. That is a helpful external signal of progress. The rest of the world is just moving along without the US.

Bob Ward: President Trump cites revival of the coal industry in the United States as his reason for being opposed to Paris, and that is basically a failure of analysis. The reason the US coal industry is going out of business is because there are cheaper and cleaner sources of power, including natural gas. If he wants to revive the coal industry in the United States, he is going to have to put the shale gas industry out of business, and it just does not make any sense. He does not understand the agreement. It is clear from his statement.

We will probably end up seeing the United States quietly revising its national pledge and submitting a weaker version of that in 2020, and that will probably be the withdrawal. The President came under a lot of pressure on both sides from other people around him before he made the decision, and he was trying to balance that in a rather clumsy way. It was clear, for instance, that the State Department and Rex Tillerson wanted the US to stay in. Gary Cohn, his chief economic adviser, wanted it to stay in. The people who were driving withdrawal, Steve Bannon and Reince Priebus, are now gone, so it may yet be a question of the President finding a way of admitting that he should not have made that decision, which, as we know, he has a general problem with.

Q13 **Drew Hendry:** Some voices challenge taking meaningful action over the next two or three years, stating that global emissions from energy and industry have been stable since 2014, only rising slowly. How do you respond to those people who say that we should take action later?

Dr Cornelius: First of all, as I said earlier, global emissions need to peak and decline rapidly to near zero, and then you may need some negative emissions. That is the idea of balancing emissions by sources and removals by sinks in the second half of the century, as stated in the Paris agreement. We know the trajectory, broadly.

The sooner you peak your emissions and the more quickly you decline, the more chance you have of limiting to a lower temperature. Any delay increases the risk of busting through a temperature limit, with the consequential adverse impacts of climate change, so you need to do it as fast as you can without crashing your economy, because you want others to follow what you are doing. I would basically say that any delay has high risks attached to it.

Q14 **Drew Hendry:** I will ask that question of the others. Just to follow up, what would you say to those who want to plan bigger emission reductions at a later date instead, once the technology cost has come down and there will be a bigger effect? What would you say to those people?

Dr Cornelius: You want to do those as well, but you still want to do the early stuff. One of the big questions that came up in Bonn was around pre-2020 action, and that includes things such as meeting Kyoto Protocol targets for those that have them. It includes finance for developing countries. It is about doing stuff now, with the recognition that the sooner you do stuff, the better you are in the longer run.

Zoe Knight: For me, it is very much about the trade-off of value destruction in the future from physical events—and how quickly those physical events are at such a scale that climate change is unanimous and the public-sector cost of rebuild becomes so significant that it has a devastating impact on your economy—versus the technology cost today.

In terms of discounting the future stranded asset potential—i.e. by taking action now—a lot of our narrative and focus is around renewable scale-up in regions where it makes sense to do so, because the costs have come down so quickly and it makes no sense at all to use fossil fuels any more; the narrative around R&D, carbon capture and storage; and utilising industrial capacity and R&D strengths to build that up.

We asked investors what their attitudes were to climate change investing, and there is a general consensus that climate change is happening, it will be severe and it will be destructive on asset values—long-term liabilities like pension funds—unless we address it now.

The difficulty is in assessing that long-term/short-term trade-off. My sense is that the investor community is thinking about that long-term trade-off. Supply-side fossil fuel models show that the carbon budget will expire within the next 15 years or so, and the asset-stranding potential is significant with them. For instance, I am seeing anecdotal evidence of a lot of people being more focused on lifespan of infrastructure, lifespan of pipelines and projects not being implemented because they are worried about capacity in relation to greenhouse gas mitigation. Greenhouse gases may have flatlined, but it is not that the decisions around climate change will go away for investors. They will continue.

Bob Ward: This year's figures from the Global Climate Project suggest that global emissions have gone up 2% this year, partly driven by an increase in emissions from China, so we are not there yet. It is too early. The argument that we should go slow now and then speed up later is fundamentally lacking in merit. It is cumulative emissions. It is not the flow in any one year; it is the total number of emissions. You put carbon dioxide in the atmosphere, and it stays there for hundreds of years. If you go slow now, you will end up having to go much quicker later on, and that is not likely to be a cost-effective way.

It also misunderstands how we get there. If somebody suggests, "We will just invest in research and development. We will find this magic silver bullet and suddenly solve it all", that fundamentally misunderstands technological progress. Most of our gains in technology are learning by doing. You try to do it. They are incremental improvements in technology. It is not about crossing your fingers and hoping that you will find a magic wand in the end that will allow you to solve this problem.

Q15 **Drew Hendry:** To be clear, you are saying that it is vital that we keep up the pace and the pressure now, in order to realise those technological advances through making sure these projects develop.

Bob Ward: It is clear that the whole world has to accelerate the rate of emissions reductions, not slow down.

Q16 **Mark Pawsey:** Can I ask a question of Mr Ward? The point of the agreement is that everybody moves at the same pace, and we effect change together, but you just pointed out that this year's emissions have increased by 2% as a consequence of what is going on in China. Given that we are a leader in these things, should we start showing a lead and moving more quickly? Would it put us at a commercial disadvantage in the industrial sector if we were to do that?

Bob Ward: The point of the Paris agreement is definitely not that everybody should move at the same pace. It is an understanding that, collectively, we have to get there. If you are in China at the moment, this is a race. This is about the future being low-carbon. It is not going to be about building coal-fired power stations and paying the cost of air pollution and climate change, which looks economically ruinous. It is about how quickly you can move into those low-carbon markets and take advantage.

If you look at this from the UK’s point of view, one thing we have more certainty about in our economic future is that, through the Paris agreement, there will be an increase in demand for low-carbon goods and services. If you are thinking about Britain after Brexit, that is one area where we will see an expansion in demand, and we have some advantages there that we can take advantage of.

This should not be about compliance with emissions targets. This is about how quickly we can move towards a future, and away from the past. The future is not going to be 19th century, Industrial Revolution technologies. It is clean technologies that are smarter, modern and more efficient. We should not be reluctantly going down there saying, “Well, we do not want to get ahead of our competitors in case they get an advantage over us”. That does not follow.

Q17 **Mark Pawsey:** Dr Cornelius, should we move at a faster pace? You have expressed some frustration that things are not going at the pace that you would like to see. Should we unilaterally take action?

Dr Cornelius: When you say “unilaterally”, I am not sure that that is the case. The idea with the Paris agreement and the UNFCCC is not, as Bob said, that everyone goes at the same pace. There is a recognition that developed countries take a lead on action, which can mean things like finance. It can mean other things: the UK, for example, is already reducing our emissions. We are down 42% on 1990 levels, so we are already on a downwards trajectory. That is just because of the state of development that we are in compared to some other countries, which may not have access to electricity, where emissions from the agriculture sector are the biggest part of their economy or whatever it is. They have other priorities—development priorities—that they are looking at.

Unilateral action may not be the right thing, but it is not about unilateral action with the Paris agreement. Everyone is putting in a pledge, a nationally-determined contribution, for 2025 or 2030, with a look to the long term, so the UK has some of these things already. There is a direction of travel, so you want to be part of that direction of travel and hopefully ahead of that direction of travel, to get some kind of competitive advantage over it. We should, and can, move more quickly.

Q18 **Peter Kyle:** I do not know who is best-placed to do so, but can you explain the rulebook, its purpose and how important it is to meeting the Paris targets? I do not know whether, Bob, you want to kick off.

Bob Ward: I, mercifully, am not an expert on the details of it. The rulebook basically has to lay out how you are going to achieve and measure whether you are achieving the goals of the Paris agreement. It has to spell out that process. Some of that is around the transparency: how do you check that people are doing what they say they are going to do? Some of it is about measuring climate, and finance flows are in there.

Basically, if you look at the Paris agreement, it is a relatively short document. The rulebook is basically spelling out the way in which this will be done, and it is driven by the parties. It is more or less about how, within the process of negotiation, countries will account for their actions, and how each country can have confidence in the other parties that they are doing what they said they would do under the COP deal.

Q19 **Peter Kyle:** I understand. Is there anything additional you want to say? We need to be quite quick, I am afraid.

Zoe Knight: It is important for benchmarking, outside of the process.

Q20 **Peter Kyle:** Thank you for being so pithy. Some officials have suggested that, between now and COP24, we are going to need much more work on the rulebook. Do you think that is achievable? Why has the rulebook appeared so contentious?

Zoe Knight: It is because all the contributions from countries are based on different baseline levels. Getting a consistency around measurement and monitoring is really difficult, because of each economy's stage in its development. The rationale for that difference gave us the Paris agreement in the first place, but, of course, measuring it makes it impossible.

Q21 **Peter Kyle:** Do you think that the rulebook will be ready for COP24?

Zoe Knight: Yes.

Q22 **Peter Kyle:** Do you all believe so?

Dr Cornelius: Yes.

Bob Ward: They have already decided that there is probably going to be an additional session. The parties all meet in Bonn in May for two weeks anyway. I think they have all agreed in principle that they will meet again, probably in August/September as well, in order to ensure that the rulebook is completed by December.

Q23 **Peter Kyle:** Finally, Stephen, what are the consequences if the rulebook is not finalised?

Dr Cornelius: That is a bit hypothetical. I believe they will complete it.

Q24 **Peter Kyle:** It is unthinkable that it will not be done.

Dr Cornelius: You need the rules next year. Arguably, you probably only actually need them in 2020, but you want to have some certainty about the things that you have to measure and how you trade units between different countries. You need to understand how you can hold the countries to account for what they have pledged, and that is what the rulebook does.

Zoe Knight: They have been working on the inventory side for quite a few years, and that is the most important thing for investors as well.

Having that inventory part of the rulebook is really important, and on track.

Dr Cornelius: We are not starting from scratch. There is a lot of history, from the Kyoto Protocol, inventories and the like, that we already know and will build on.

Q25 **Antoinette Sandbach:** In terms of the Talanoa dialogue, UNEP has suggested that, effectively, the revision of government pledges by 2020 are the last opportunity to close the emissions gap by 2030, to keep the world on track for this below two degrees temperature rise. Has COP23 made enough progress on the organisational arrangements of Talanoa?

Dr Cornelius: You are right. There was a UNEP report, and a number of other reports came out during and around COP saying that there is a big gap. Our concentrations of PPMs are the highest that they have ever been. Basically, the message is the same: "You need to do more".

We know that the pledges that countries have made, which are typically 2025 or 2030 pledges, do something. They start moving the emissions from business as usual—four-point-something degrees—down to three-ish degrees, so they do something, but we know that they are not enough to bend the curve, as we said earlier. The Talanoa dialogue is recognised in a COP decision. There is a design that involves both the current Fijian presidency and the future Polish presidency. They will have a so-called preparatory stage phase, where they will be taking information from all over the place.

Q26 **Antoinette Sandbach:** Can I cut to the chase?

Dr Cornelius: Please.

Antoinette Sandbach: Do you think that they can achieve the cutting of that emissions gap at Talanoa? Has enough preparatory work been done to get that kind of outcome?

Dr Cornelius: Yes, but it will not necessarily lead directly to the cutting of emissions pledges next year. It is to inform countries, so that, before 2020, they will revise their pledges for 2030 and, in theory, make them tighter, because they realise that the gap is bigger and there is more that they can do.

Bob Ward: There is a great concern that the Talanoa dialogue is so worried about avoiding confrontation between countries that it will not drive a sufficient increase in ambition. I think they recognise that, and there is a specific, explicit provision that they want non-state parties involved in the process. It is going to rely on NGOs and the research community to start analysing what people are saying, and saying whether that is good enough or not.

Q27 **Antoinette Sandbach:** That third-party input could be crucial in putting pressure on states.

Bob Ward: I can see the dialogue not driving sufficiently increased ambition without those third parties very strongly driving, and holding to account, every single country for what it has planned. That includes the UK.

Q28 **Antoinette Sandbach:** Do you think the UK should be doing more to support the preparations for Talanoa?

Bob Ward: The UK has a very good story to tell, not just about the example it has set domestically: it has increased its economy by 67% since 1990 and reduced its emissions by 42%. That shows that this can be done, yet we are afraid of telling that story.

In particular, we are too timid about talking about the great work we do in supporting other countries in reducing their emissions. While we were there in Bonn, the UK announced a major investment of £177 million in a new facility to drive investments in sustainable infrastructure in Latin America. You will not learn about that from the BEIS website, because it did not mention it. It was not on its Twitter account. It was announced by the Inter-American Development Bank.

I do not know what the reason is. Perhaps the Government are afraid of the *Daily Mail* finding out that it is spending money overseas in helping to reduce emissions. The point is that the UK has an excellent track record and is recognised as a leader in supporting cost-effective emissions reductions around the world, which is the only way that we are going to get there. The rich countries have to do their fair share of helping the poor countries.

Q29 **Antoinette Sandbach:** You do not think that the Government are shouting enough about it. It is quite nice sometimes to talk about success stories as well as look as the failures. If you have specific examples that you could write to us with, that would be really helpful when we are looking at our report in the future.

Bob Ward: You might care to ask the Minister, when she appears, why that announcement was not made. The same happened with the Intergovernmental Panel on Climate Change. Emmanuel Macron came to the summit and announced to all the delegates that France was going to increase its contribution. BEIS tweeted it out. That was the contrast in the way in which we approached it: the UK doubled its contribution, and it got a tweet. France announced an increased contribution, and it got the President to announce it.

Antoinette Sandbach: Thank you. That has made the point admirably.

Chair: Never knowingly undersold.

Q30 **Vernon Coaker:** Returning to the issue of investment and business, the United Nations Environment Programme's recently published emissions gap report said that globally, under current national policies, we will not have a 2% or a 1.5% increase; we will have a 3% increase in global warming by the year 2100, which I think would be catastrophic if it came to pass. Why is there this mismatch between what the United Nations is saying globally is going to happen, and the national ambitions that we have just been talking about? Clearly, Zoe, that must have an impact on investment decisions that people are making, nationally and internationally.

Zoe Knight: The UNEP gap reports—there have been about five or six of them by now—have been a really important tool to raise awareness among investors of how to shift away from fossil fuels. The fundamental issue is still, in many ways, lack of awareness of how to make investment greener. The green bond market is helping with that, because it is driving definitions. The risk-reward profile is still not great for some infrastructure projects within, say, transport; moving to high-speed rail, for instance, would be a great way of raising productivity in an economy and decarbonising.

Basically, we need more blended finance between public and private infrastructure to bring in more globally diverse capital flows. The UK could be really good at that, because it can drive this financial centre hub initiative, either partnering with China or partnering outside. It is an awareness, a definition, a standardisation and adjusting the cost of capital for old-fashioned projects.

Q31 **Vernon Coaker:** If I am a business—we are talking about climate risk disclosures—and I am making an investment decision, what is the assumption that I should make? Is the business making the assumption that the world will warm to two degrees, 1.5 degrees or three degrees in its climate risk assessments, or in terms of how and where it makes that investment?

Zoe Knight: Some companies—the largest companies—have scenarios around all three of those temperatures.

Q32 **Vernon Coaker:** They make three separate assessments.

Zoe Knight: Some do. If you are an oil and gas company, or a mining company, all those guys have 1.5, two and three degree scenarios. Some of them disclose across that board; some of them do not.

Among the financial community, many of us are working out what it means for our loan book, around what a 1.5 degree, two degree and three degree world will look like. That work flow is going to be over the next year to two years, because we just do not have the framework to do that as yet. For the supply chain to the fossil fuel industry, I do not think that those guys are factoring it in at all. That is where a lot of work needs to be done by the likes of us and PwC.

Q33 **Vernon Coaker:** I am interested to pursue this. How does that affect low-carbon investment?

Zoe Knight: In some cases, the cost of capital is being affected, and it is getting increasingly expensive to be involved in high-carbon sectors. That is quite early days, but will only increase in the future.

Q34 **Vernon Coaker:** It is hugely important, is it not? We do not discuss it very much, yet it is massive.

Zoe Knight: Yes.

Q35 **Vernon Coaker:** Moving on slightly, achieving the Paris agreement target of net zero relies on removing greenhouse gases from the air, yet many of the technologies to achieve that are unproven. Are we doing enough to develop these? How are we going to encourage people to invest in unproven technologies, where they might invest a lot and not actually have success at the end of it? Where is that going?

Zoe Knight: Where is it going to come from? That unlocking capital debate is still unsolved, in the sense that some of it will come from ultra-high net worth entrepreneurs, along the lines of the Musks and co who are looking at innovation. Some of it will come at the grassroots level. I am not sure that we are doing enough to create the awareness of what climate scenarios actually mean, and what net zero means. I do not think we know all the answers. We are working quite hard across the financial system and the academic institutions to figure out what net zero looks like, but it is very entrepreneurial innovation.

Q36 **Vernon Coaker:** Should the Government be doing more to encourage and develop these negative emission technologies?

Bob Ward: The Government will have to declare their hand soon. They are waiting for the advice from the Committee on Climate Change; Baroness Brown talked about that. Remember that, after the UK leaves the European Union, it has to submit its own nationally determined contribution to the Paris agreement. It is currently a party to the EU's. It will have to have its own, and it needs to lay out how it is going to meet the Paris agreement goals, including net zero. I have to say that one of the major problems we have at the moment is that the only thing we really think we know how to do to get negative emissions is bioenergy plus CCS.

Q37 **Vernon Coaker:** Sorry, what is that?

Bob Ward: Bioenergy.

Vernon Coaker: Oh, bioenergy. Sorry, I misheard you.

Bob Ward: It is bioenergy plus carbon capture and storage, but many within the climate action advocacy community are against CCS. They do not want to see it develop, because they think it is a get out of jail free card for the fossil fuel industry.

Q38 **Vernon Coaker:** Why do they think that?

Bob Ward: Most of the people promoting carbon capture and storage are working in the oil and gas industry. How we would develop CCS without the involvement of the oil, gas and coal industries I do not know, but we are not getting to grips with that conversation. The CCS community has been hopeless in trying to drive this forward. There is a lack of reality among many NGOs about our requirement to develop negative emissions technology, because CCS will have to be part of that.

Q39 **Chair:** Could I ask, finally, how us leaving the European Union will affect the way in which the UK participates in future in these COP negotiations, and whether that gives you any cause for concern?

Zoe Knight: It does not give me cause for concern. Working on the assumption that the UK is still going to be part of the process and will still send a delegation, going back to the point that Bob made earlier about showcasing our strengths, it gives us a good opportunity to start being more vocal about our strengths and demonstrating that we are the leaders in trying to promote green financial markets and green definitions. We can improve our productivity by scaling up infrastructure, so it does not really give me cause for concern.

Bob Ward: There is a danger that, if we are no longer part of the EU negotiating team, we will have less influence. We can, then, choose to emphasise our links with other groups within the UNFCCC. The High Ambition Coalition, which drove the more ambitious temperature target, is one opportunity.

The UK's negotiating team at BEIS, led by Pete Betts and Archie Young, is widely recognised as one of the most experienced and skilful teams. They really should be making the Minister very proud with all the efforts that they do, and I think that they will continue, simply through their expertise and skill, to be influential in the discussions, even if the UK's specific role in this process is diminished by being one party, rather than part of the European Union.

Dr Cornelius: That is right. The UK has historically pushed the EU to have more progressive, ambitious positions than it otherwise would have without our involvement. It will be a decision that the UK has to make as to whether it keeps supporting the EU's positions, perhaps without being inside and able to shape them, or whether it joins another grouping—for example, the Umbrella Group, the High Ambition Coalition or some other group—to amplify the voice of one country.

Chair: Thank you very much for your time today. It has been very interesting.