

Business, Energy and Industrial Strategy Committee

Oral evidence: Clean Growth Strategy and International Climate Change Targets, HC 871

Wednesday 8 May 2019

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Members present: Rachel Reeves (Chair); Vernon Coaker; Drew Hendry; Peter Kyle; Sir Patrick McCloughlin; Albert Owen; Mark Pawsey; Antoinette Sandbach.

Questions 195 - 269

Witnesses

I: Chris Stark, Chief Executive, Committee on Climate Change; Professor Albert Klein-Tank, Director, Met Office Hadley Centre for Climate Science and Services; Baroness Brown of Cambridge, Deputy Chair, Committee on Climate Change.

II: Nick Molho, Executive Director, Aldersgate Group; Will Webster, Energy Policy Manager, Oil & Gas UK; Nick Robins, Professor in Practice, Sustainable Finance, Grantham Research Institute on Climate Change and the Environment, London School of Economics.

Examination of witnesses

Witnesses: Chris Stark, Professor Albert Klein-Tank and Baroness Brown of Cambridge.

Chair: Thank you very much to the three of you for coming to give evidence to us this morning. Thank you also for the report *Net Zero – The UK's contribution to stopping global warming*, which was published last Thursday. It is a really welcome contribution to this debate. We appreciate you coming so soon to give evidence to the Select Committee.

We have two panels of evidence this morning, so we will try to get through this reasonably quickly to allow members to go to Prime Minister's Questions a little bit later.

Q195 **Albert Owen:** Can I start by asking you, Professor Klein-Tank, about climate change impacts? What would be the global impact we should expect if temperatures go beyond the 1.5 and 2 degree targets that have been talked about? What would that mean for the United Kingdom?

Professor Klein-Tank: Thank you very much. It is good to remind ourselves that the 1.5 and 2 degree targets are not really targets that, when we cross these, will lead to major, global-scale disasters. It is much more about changing the risk of extremes, such as tropical cyclones, heatwaves or flooding. These are very regional. It is key to understand and to know how the patterns of these risks on a regional scale change according to the particular level of global warming. When we cross 1.5 degrees or 2 degrees, or if we continue on the current trajectory of the present day, we should be able to find out and know what these patterns of changing risk are.

The report gives an excellent summary of these impacts. In box 5, there is a summary of the impacts for the UK. It is all based on the latest science laid out in the report by the UN climate panel, the IPCC, produced last year. The Met Office and UK academia has contributed to the latest science on the impacts.

Let me just pick out one or two examples. One example is on species extinction. This is very relevant, given last week's report on biodiversity. There is a much larger chance of the extinction of species at higher warming levels compared to the 1.5 and 2 degree scenarios. There is a lot of scientific evidence for that. The other example is related to the UK. If you look at water stress, flooding risk, coastal erosion, summer heat stress, clearly the risks are much higher at the 4 degree warmings or the larger warmings compared to the 1.5 and 2 degree levels.

If it comes to the difference between the 1.5 degree and the 2 degree targets, there is also a clear difference. There was a UK-led study, which also fed into the IPCC report, led by Arnell et al, a couple of years ago. They mentioned that the difference between the 1.5 degree and the 2



degree levels, for instance, is a difference between 27% and 62% lower impacts in these different areas of the UK. There is a clear difference.

One final thing to remember is that this is not a linear scale. It is not that with a doubling of the warming, the impacts will also double, or that with half of the warming, the impacts will halve. It is much more non-linear. We can avoid a lot of impact by keeping to the lower levels. There is scientific evidence that this is a non-linear scale.

Q196 Albert Owen: These temperature increases have been known for some time. What is different now? What is it in the frame of mind that says there is a climate emergency now? Why does the committee emphasise this more than it has in the past? Is it because there is international agreement? Is the science becoming more profound?

Professor Klein-Tank: I fully agree that we have known this for quite some time. You must also realise that the climate has already warmed at a global scale by 1 degree, so we already see the impact on the extremes in present-day observations. What has changed compared with a couple of years ago? The science has matured. For instance, one example is how we attribute these particular extreme events, like the UK summer heatwave in 2018. We can really pinpoint what the contribution of human-induced climate change was to this particular event. It is not only for the UK; we can do this worldwide. It was not so mature a couple of years ago.

The other urgency now is caused by the UN's *Special Report on Global Warming of 1.5°C*, where the UN climate panel summarises all the existing evidence that is available on this particular target. It is now giving a much more mature picture of the impacts and the risks. These changes in risk at the global scale are really key to understanding this.

Q197 Drew Hendry: I would like to ask the panel this question. What needs to happen to deliver the net-zero target? Could we start with you, Baroness Brown?

Baroness Brown: First of all, we need to build on the Clean Growth Strategy. The Government have made a good start with the Clean Growth Strategy, but it is not enough and things are not happening fast enough. For example, we need very much tougher targets on decarbonising transport. It will be too late to say that all cars need to be zero carbon by 2040. We need to bring that forward; we need to give the automotive industry a very strong signal that they will not be able to sell a car that is not zero carbon. We would like to say by 2030; it may be 2035, but 2030 would be better.

We absolutely need to be ready to take a decision on how we are going to decarbonise buildings. This is one of the most challenging areas. It will need Government leadership, because if we are going to have a switchover, for example to hydrogen, that will need national action. It will need the Treasury to look at how we make sure the costs of that fall



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fairly and are not disproportionately hurting the fuel-poor, for example. We also need some serious demonstration to show how that can be done. That needs to start now.

We need carbon capture and storage clusters much sooner than the Government are talking about having them. Yes, we also have some wonderful things called trees that take CO₂ out of the atmosphere. We have some targets for forestation, and we are just about meeting half of them. Tomorrow, we need to be saying, "We are planting at least twice as many more trees". That is something we can turn around and do immediately, but they take a long time to grow and for us to get the benefit of them.

All of these things need acceleration. We need really strong action. We have said, in presenting this report, that there is no point in the Government saying, "We accept the targets". In that case, we, as the Committee on Climate Change, might walk away and say, "If that is all you are doing, we might as well resign". If you accept these targets, you accept that you have to put in place the leadership and the action that will make a difference. That has to be cross-party. The whole of the House has to agree to that, because industry and the other people who have to go through really significant changes have to see that there will not be chopping and changing if a Government changes; they have to see that there will be continued support. Making the investments that are needed is the right thing to do.

Q198 Drew Hendry: Chris Stark, Baroness Brown mentioned carbon capture and storage and transport as a couple of other issues. What are the most urgent next steps that the Government need to take? By when do they need to take them?

Chris Stark: There are a number of choices for Government and many of them now need to come within the next few years. We have listed a few of the things that need to happen rapidly, but it is very important to have a plan for decarbonised heat and buildings, as Baroness Brown says. There is already an initiative underway in Whitehall to build a strategy for decarbonised heat. That needs to be delivered; we need to understand that by 2020 at the latest.

Similarly, for carbon capture and storage to be a meaningful part of this decarbonisation strategy, we have to understand what the plan is. That might not mean the plan itself is being rolled out at scale over the next couple of years, but we need to understand what that plan is so we can get ready for investment. Just as Baroness Brown says, the switchover date for electric vehicles is far too late. That is something we can plan for earlier. I would love to see the Government act on that as quickly as possible by bringing forward that date. We will also need an agriculture and land strategy as well. Again, in Defra there is a plan to produce that plan, but it is not yet a net-zero-proofed plan, as far as I am aware.



So there are things in place that we can look to and see the germ of the net-zero policy strategy, but at the moment there is not the appropriate level of ambition.

Q199 Drew Hendry: Would it be fair to say—this question is to both of you, Baroness Brown and Chris Stark—that there is a feeling of there being a need to ramp up the urgency quite considerably and to have a clearer plan for the future? If that is correct, on that basis, Professor, what needs to be done between now and 2030 in addition to the actions that have already been agreed by the Government, in your view, to tackle this issue?

Professor Klein-Tank: I can only refer to what the UN IPCC panel has laid out in terms of the different pathways to reach these targets or stay below these target warming amounts. There are several different options. The report goes a long way towards sketching these and making recommendations. From the science, it is all about supporting this with scientific evidence. That is what the report has done. It is mostly based on the IPCC work, to which the UK academic community contributed.

Q200 Drew Hendry: Finally, on that question, what needs to be done by 2030? Could you just give me a couple of simple lines or a very simple direction? What needs to be done by 2030 in addition to the actions already agreed?

Baroness Brown: We need to have ramped up to 100% of new cars being zero emissions, so electric or, for people with very long distance requirements, hybrid electric and hydrogen, perhaps. That is something we could do. Countries like Norway are already up to 40% electric cars. There is absolutely no excuse by not doing that by 2030.

We will have had to make a decision and started to implement zero-carbon heat in buildings. We will need to have installed—Chris will know the number—an enormous number of heat pumps and possibly hydrogen-pump systems. We will have to have implemented, we believe, hydrogen as part of that hybrid heat pump system already in some areas of the UK. We will have to be building houses and refurbishing homes to a much higher installation standard than we do at the moment. We will need to have improved our building regulations so that we really are producing buildings that are fit for the future.

As I say, we will need to have got up to speed on our tree-planting. That will hopefully be on track, because it is such an important element. We will need this land strategy. It is all the things that Chris has told you we need.

Chris Stark: I would just add briefly to that. By 2030, we need to be deep into deploying this stuff. This is the key decade now. All of these things we are discussing are not new. We are now moving into a phase where they now need to be delivered. The only thing I would add to the list Baroness Brown has told you about is the big challenge of scaling up



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electricity supply, which is something the Government of course already have plans for. Again, however, they need to be net-zero-proofed. We are talking about scaling up at a scale that is fairly unprecedented. Let us put it that way. This needs to be really focused.

Baroness Brown: We will also need to be producing hydrogen in significant quantities. That will probably be through steam reforming of methane with carbon capture and storage and quite possibly with hydrolysis, which we might be using for the purpose of supporting the balancing of the grid.

Q201 **Sir Patrick McLoughlin:** Chris, can I ask you this? How compatible is the continuing use of fossil fuels with achieving the net-zero target?

Chris Stark: There is a fairly simple bit of science that says that we cannot continue burning fossil fuels unabated. As we burn fossil fuels, we are growing the stock of carbon dioxide in the atmosphere. Every tonne of carbon matters; it does not matter where it is emitted. We therefore have a challenge: either we stop burning those fossil fuels or we start sequestering them, taking the carbon out when it is burned, or we do both. We probably need to do both. Certainly, in our scenarios we have both. We are still using fossil fuels at scale but not as we use them now.

A very simple thing to say in response to your question is that we cannot keep burning fossil fuels. It is a very obvious thing. We have known it now for a very long time, and we therefore need a different kind of strategy. The question of how compatible fossil fuels are with the climate targets is one of those big questions for Government. There are choices there.

Q202 **Sir Patrick McLoughlin:** Surely it is a question for you.

Chris Stark: I agree. We have set out in this document a possibility to get to net zero. We do use fossil fuels—we actually use quite a lot of fossil fuels—but there are choices in terms of whether what we have set out in this report is the right strategy. We have erred on the side of caution in our continued use of fossil fuels with carbon capture and storage. It is perfectly possible for a different scenario to play out where we have a more electrified economy, more nuclear, for example, and more renewables. All of that is perfectly possible but it requires the policy to support it.

The question of how much we are going to be using in 2050, for example, is a very difficult question to answer, because it depends very largely on the policies to deliver it, but everything must be delivered underneath those carbon umbrella targets. That means, therefore, that we cannot keep burning them unabated.

Q203 **Sir Patrick McLoughlin:** Baroness Brown, how certain are you about the science behind what we are being told today? Can I give you an example? Twenty-five years ago, we were told that we could convert to diesel cars because diesel cars were going to help us have a cleaner set of



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emissions. Now, of course, we know that was probably bad advice. Government decisions were taken on that; incentives were given to get people to buy diesel cars. Now everyone is saying that was a wrong decision. How certain are we about the science behind what the committee has come forward with?

Baroness Brown: If it is the science of climate change, I will defer to the fact that we have an expert here with us. I feel very confident. We have two climate scientists on the committee; we have a climate scientist on the secretariat team; and we take a lot of advice from colleagues in the Met Office and elsewhere. I am very confident that we are getting the best advice on that science.

On the issue of diesel cars, diesel cars are more efficient than petrol cars, so they do emit less CO₂, from the climate perspective. What we had not anticipated was the increasing understanding of the role of particulate carbon. Even though diesel cars today emit much less particulate carbon than diesel cars did 25 years ago, of course, we have seen a huge increase in the numbers of them. That has meant we still have a particulate-carbon problem. Diesel cars are not the only emitters, however. Coal-fired power stations and industrial processes using coal emit particulate carbon as well and contribute to that.

We always need to be on the lookout for whether there are unintended consequences and we need to weigh them up against the benefits. I should declare that I have been the sector champion for the offshore wind sector deal. We know that there are certain challenges with wildlife in terms of offshore wind in some locations. On the other hand, here is a zero-carbon form of energy that in the UK by the mid-2020s will probably be one of the cheapest ways we can generate electricity. We have to balance these things and try to make sure that we take the best pathway in terms of emerging knowledge.

Q204 **Sir Patrick McLoughlin:** We are not going to be told in 20 years' time that we have made some terrible mistake with hydrogen because there was a side effect or impact of using more hydrogen.

Baroness Brown: We are very alert to things like that. There are things we need to do more work on. Hydrogen burns at a higher temperature than methane, so we need to understand the implications for producing NO_x, for example. The evidence at the moment is that it can be managed, but in terms of using hydrogen in industrial processes we may need to understand the NO_x implications of that, because we do not want to start increasing the NO_x levels. That is one of the other problems with vehicles, of course.

Q205 **Albert Owen:** Chris Stark, what has changed since 2016, when the CCC recommended against adapting to a net-zero target in the UK?

Chris Stark: A lot has changed. The most obvious thing to say is that we now understand from the IPCC some of the pathways to achieving the 1.5 degree threshold that you see in the Paris Agreement. More than



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that, for the committee, we have a stock of knowledge and analysis that we did not have in 2016, which has allowed us to present the report we did last week.

We have seen continued cost falls in some of the key technologies. That is the first thing to say as the backdrop to this. What we have been able to do in this work is something that we did not have the evidence to do just a few years ago. We have commissioned 10 separate pieces of analysis on each of the sectoral challenges. We have had three expert groups looking at the net-zero challenge overall. We have also conducted very deep pieces of analysis on the questions on the role of biomass in the economy, hydrogen and land use. We have a set of new land-use scenarios. We conducted all of that work so we would be ready for that analysis.

That has given us a platform that we did not have a year ago, which allows us to look out to 2050 and build a set of new sectoral scenarios from the bottom up. That allows us to say with confidence to you today that we think we can get to net-zero emissions as long as the policies are in the right place to deliver it. We have never been able to say that before. That is the basis for that recommendation.

Q206 Albert Owen: You have now included international aviation and shipping, which was not previously done. We all knew that aviation was polluting the atmosphere; we all knew shipping was doing exactly the same. This was available to you then. Why did you not include it in previous ones and why have you included it now? Was it because there is an international dimension to this?

Chris Stark: There is that, yes. The committee has always brought them into the analysis. Indeed, one of the reasons we talk about the present target, which is an 80% target, being at least an 80% reduction in emissions is because we knew we wanted to factor in some of the sectors that at the moment are not officially part of the carbon budgets and the target. There was a belief at the time, in 2008, when the Climate Change Act passed, that international aviation and shipping were issues that should be dealt with outside of domestic policy.

Q207 Albert Owen: That does not inhibit you, as an advisor, from advising.

Chris Stark: Exactly, yes, and we always have. The key thing is that we have always factored them into our analysis; we have always given advice to Government on what to do about it. Zero means zero. That means we need to have a plan here in the UK that gets us to net zero. It may be that those international mechanisms for international aviation and shipping deliver an emissions reduction in the UK, or at least a net emissions reduction in the UK. For us, if we are to have a net-zero target in the UK, we need to be confident that they are working or we need a domestic plan to deliver it.

Q208 Albert Owen: What practical solutions can we look for in shipping, for



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instance? If a vessel comes into a UK port, will it have to switch off its engines or capture its emissions? Is that what we are talking about? Is it that kind of thing? I know it happens in Scandinavia, and some Scandinavian companies operate in the UK.

Chris Stark: We have looked very closely at what can be done with fuels, in particular hydrogen and, for shipping, ammonia, a form of hydrogen. That seems to offer a way through. I will go back to my earlier point. For those international sectors, it is really important they are part of the global mission to get to net zero. It is therefore very important that the UK, in setting a comprehensive target like this, leads some of that, just as it has in the past. For those sectors that need to have that global deal, here in the UK, in setting this target we can lead the charge on that. There are technical solutions for shipping.

There is a different set of solutions for aviation, where it is less obvious that you can remove yourself entirely from fossil fuels. You therefore need the aviation sector to care more about carbon capture and storage and removals or offsets, as they are sometimes known. Again, these things can be managed.

Q209 **Albert Owen:** Can I ask Baroness Brown about offsetting the carbon credits, the international offsets? Why can we not rely on an international cutting? It is a global issue.

Baroness Brown: It is. There are several reasons why we recommend we should try to do this domestically without relying on credits. First of all, by 2050, credits will be hard to buy, assuming that everybody is on this trajectory. They will be very expensive. It will be cheaper for us to do it without having to resort to buying credits. It will also be more of a stimulant to our industry to be producing these zero-carbon products and services and, therefore, it will give us the export opportunity if we are ahead of the game in doing this.

However, we are assuming some things, like the processes for removing CO₂ from the atmosphere, will work at scale and they will still be expensive, but we will be able to use some of those to get us to net zero. A small number of these things are not entirely fully demonstrated at scale, so we do say that there is always a contingency, if this turns out to be more difficult than we think it will be. Based on past experience, we actually think it will be cheaper and easier than we think it is going to be, but we have been very cautious and we have tried to rely only on technologies that we know exist.

Q210 **Albert Owen:** Can you clarify for me the difference between the nation states and the UK? When you say "the UK", you mean the four nation states. Why do you exclude Northern Ireland? Is there an England-only target?

Chris Stark: We could probably calculate what that target for England would be. We definitely did not exclude Northern Ireland. This is very important. The reason we gave the advice we did is because we were



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asked. We provided advice on a UK-wide basis. The letter that prompted this piece of work from us was a joint letter from Ministers from the UK Government, the Scottish Government and the Welsh Government.

We give advice to Northern Ireland, but there is not a statutory framework in place for Northern Ireland to set its own emissions targets. That is something that, in the end, might be very useful for them to have, but of course they do not have the ability to do that at the moment. We are absolutely not ignoring Northern Ireland or England.

Q211 Albert Owen: When you talk about the UK, you mean 100% of the whole of the UK.

Chris Stark: That is correct. It is worth saying that the advice we have offered on the targets for Wales and Scotland are compatible with that UK-wide net-zero target in 2050. That is effectively our understanding of how best to allocate the effort.

Q212 Albert Owen: As a Welsh MP, why is Wales going to take longer to get to that 100% target? I hear it is about agriculture, but, again, I cannot make that distinction in agriculture.

Chris Stark: I am really glad you asked that question. It is absolutely not about, for example, Wales's willingness. It is about a set of natural capabilities. If we take Wales for example, there is proportionately less opportunity for Wales to store carbon. If you take carbon capture and storage, for example, which is something I know this Committee has been very interested in, it is simply not the right side of the country to do most of the CCS that the UK might need and, therefore, it is harder to do the removals. You therefore have a set of conditions that are different in Wales compared with, for example, Scotland, where there is a greater proportionate ability to do that.

In the end, that means that in 2050 the emissions from agriculture are very difficult to get to zero entirely, not without very substantial changes to the agriculture community that already exists in Wales. We do project some changes by 2050, but we do not think it is possible to get all the way to net zero for all greenhouse gasses. Scotland is different, mainly because it has that natural ability to store carbon, plus the industrial opportunity of carbon capture and storage, and of course the North Sea right next to it. Therefore, it can go further and faster by 2045. Again, both of those targets are net-zero targets. They are compatible with the UK-wide target.

Q213 Albert Owen: Why did you not consider an earlier date for your target, as many were calling for?

Chris Stark: We have considered earlier dates. Indeed, we looked specifically at the date of 2045. It is worth saying that some sectors can go faster and sooner, and they will need to. The most obvious example of that is the power sector, where it is possible and we can see how it can be done.



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It is a judgment, which is why we have a committee. We made a really in-depth analysis of when we felt it was appropriate and possible, and our current and future technologies, with cost reductions built in. It is worth saying that anything prior to 2050 looks very risky and would probably incur scrappage costs. You have to think about the capital stock turnover that is necessary by then. There are physical barriers: you need to grow enough trees; you need to decarbonise every house across the UK. There are several barriers to doing this prior to 2050 that you have to overcome.

It is very important to say this: 2050 is very ambitious. It is very, very ambitious. The strategy we have laid out in our recommendations to Government is not in any sense an easy strategy. In particular, we need to think about buildings in the UK, how we decarbonise industry, heavy goods, which is not a question the UK can answer alone, and the deforestation question. These are physical infrastructure questions that need to be answered over a relatively short timescale. If policy was put in place sooner, if it was done with the appropriate ambition, it may be possible to do this earlier. Indeed, the hallmark of what the UK has done so far on climate change and emissions reduction is that the targets are reset when the evidence supports that. At the moment, however, as we look out to 2050, this is the earliest date that we can see we could achieve net zero.

Q214 Chair: Chris Stark, if we treated this as an emergency, if we spent more money on it, speeded up some of these policy responses and scaled up sooner, would it be realistic to get there by 2045 or even 2040?

Chris Stark: What we are advising today has all of those hallmarks. The strategy that is required to meet the 2050 date includes a very substantial turbo boost, if I can put it that way, to policy right across the piece.

We have the Clean Growth Strategy, but that is insufficient. We need to deliver everything that is in there. We need to deliver all of the ambitions and all of the policy and add in all of the things we talked about earlier. We still see that 2050 is the earliest date to achieve that. If we go harder at some of those things very quickly, it is possible that we might get there sooner. Indeed, if we were to do that, this would be the sort of thing the committee could look at in due course. At the moment, this is a very ambitious strategy to get to 2050.

It is worth saying that in our scenario we do not get to net zero. All of the things we have already talked about get you to about an emissions reduction percentage in the mid-90s. Then we have a pot of speculative things. We need time for that pot of speculative options to be developed as well. Again, all of the conditions have to be right for you to set an earlier date than 2050, and our judgment at the moment is that 2050 is the right date for that ambitious strategy.

Q215 Chair: Baroness Brown has said that signing up to these ambitions is, in



a way, the easy part; the hard part is then delivering on them. To focus on the ambitions, we already have the Climate Change Act. What would you want to see the Government do now in terms of legislating? Can you confirm that this would be possible through secondary legislation? You do not need primary legislation to get a net-zero target by 2050? Is that right, Baroness Brown?

Baroness Brown: We understand you can change the 2050 target through secondary legislation, yes.

Q216 **Chair:** When should the Government do this?

Chris Stark: It is a political question, is it not? However, there are two big moments coming up this year when it would be an important signal to the world for the UK to have a target like this. I will just reinforce the earlier point: it is more than just a target. We need a plan to meet it. However, there is a decision in June, at least in principle, on whether the UK will host the COP, the summit that is held each year on climate change. That COP would be next year. That is a very important moment for the world to begin its journey of addressing the Paris Agreement properly. Then there is the big UN summit in September.

If we do not know by September, we are in quite interesting or difficult territory. It is difficult for us on the committee. It is our intention that we would offer our advice on the carbon budgets next year in light of Parliament's decision on this recommendation. We would need to know that certainly by the end of the year at the very latest.

Q217 **Chair:** If we want to hold COP26 in the UK next year and if we really want to be a global leader on this, your recommendation is that we should legislate or introduce that secondary legislation before the summer recess. Is that your view, Chris Stark?

Chris Stark: Again, it is a political question, but I certainly think it would be a big statement and a big signal.

Q218 **Chair:** Baroness Brown, what is your view?

Baroness Brown: It would be a very strong signal. If we seriously want to show climate leadership—having the COP here in 2020 is part of that—then we need to show climate leadership, which means doing this with the urgency it deserves.

Q219 **Chair:** To play devil's advocate a little bit, why should the UK move further and faster than other big emitters of CO₂, such as China and America?

Baroness Brown: With China, there is a moral issue. We are a wealthy country because of the industrial revolution and what has happened since then. If you like, we have benefited from the creation of the problem over hundreds of years. Other countries such as China have not. On a per capita basis, we are responsible for the second largest contribution to historic emissions, which are causing the climate change we are seeing



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now. We therefore have an obligation to go faster than developing countries in addressing that problem.

Q220 **Chair:** The UK has been a global leader in this area. The first climate change Act ever was legislated for in the UK. If the UK adopted a weaker target or did not change the target we currently have to the one you have recommended, what signal would that send to other countries?

Baroness Brown: There are a lot of countries at the moment that are in the process of setting targets around 2050 or earlier. We have the EU, Sweden, France and California. Germany are looking at their climate change Act. There are a lot of other smaller countries that are also thinking of setting ambitious targets. If we say, "We are not going to", they will all be thinking, "Why are we pushing ahead?"

However, there are also so many benefits for us. There are benefits for our industry. We are beginning to see the benefits of being early into offshore wind. We can see the benefits that it is already delivering and the benefits it is increasingly going to be delivering to jobs in our coastal communities and things. We are also hoping to build exports on the basis of that. We will be making again, as we were at the time of the industrial revolution, and developing again the technologies the rest of the world wants to buy.

Q221 **Chair:** Those are all strong arguments, Baroness Brown. In the report you published last week, there is a lot of focus on the costs of transition but not so much on the economic benefits, for example, in terms of savings to the NHS if our air is cleaner or the benefits you have spoken of, Baroness Brown, in terms of jobs. Does the report you published last week include the benefits of these changes as well as the costs? Are you just focused on the costs?

Baroness Brown: We have been most focused on the costs, because some of the benefits come further down the line. However, the big benefit is avoiding significant further climate change, the costs of which are enormous.

Q222 **Chair:** When you say the estimate of getting to net zero will cost between 1% and 2% of GDP, that is not a net cost, is it? That is the cost not including the benefits. Presumably, if you include the benefits, the economic costs of achieving this are lower than you have put in your report.

Chris Stark: It does include some assessment of benefits. For example, if you make the investment to have a zero-carbon power sector, there is a saving in the form of reduced fuel costs. We net that off. The overall cost of investing and incurring those costs, plus the benefits, especially in the form of fuel savings, not having to spend on fossil fuels, is part of that assessment. Where we have been cautious is not to go further and monetise the co-benefits.



The co-benefits are enormous. It is worth saying that. It is a harder thing to monetise; it is a harder thing to assess. Even if you just look at the health and environmental benefits, you can get to a figure that, when washed against those GDP costs, might even negate them entirely. It is appropriate that we were cautious about that, because it is important that we are clear that there are costs that need to be incurred that policy needs to manage. If we do so, we can enjoy those co-benefits, and we list them in the report.

Q223 Chair: It would be more honest if we were upfront about the benefits here as well. If we are a global leader on this, presumably there will be opportunities to export. If we move towards a more hydrogen-based economy and make those changes in people's homes, an awful lot of jobs will be generated. I am a bit surprised that those important benefits are not captured in the report.

Chris Stark: We do make an assessment of it. What we were careful not to do is simply to wash them together and say that there is no cost here. For example, we look at human health, air quality, the impact of things like active travel and healthier diets. As you have mentioned, jobs and new industrial opportunities will come with this. Just as Baroness Brown mentioned, there is also this big benefit of avoiding climate damage overall. We do look at what impact that would have; what we are not doing is simply mixing those things together and saying, "This is easy". This is a serious attempt to set everything out in a clear and transparent way.

Q224 Antoinette Sandbach: Why is it cheaper for us as a country to act earlier?

Baroness Brown: There are all sorts of areas where it will be cheaper. By the mid-2020s, we will be generating electricity more cheaply from offshore wind than we are currently from our present fossil-fuel fired plants. We will have cheaper electricity than if we went on using fossil fuels. Driving in an electric vehicle by somewhere in the mid-2020s or late-2020s will be cheaper. The cost of the vehicle will be equivalent or cheaper, the fuel will be cheaper, and the maintenance on the electric vehicle, which is a simpler vehicle, will be cheaper. The sooner we transition to that, the sooner motoring will become cheaper for those who do it.

Q225 Antoinette Sandbach: That works for motoring, but are there sectors where it will not be cheaper to act earlier?

Baroness Brown: One of the challenges we have is this issue of heating of buildings. That is one of the reasons why we need the whole of Government engaged. We have asked for the Treasury to do a review of where the costs of this change fall, so that we can make sure that policy can deliver fairly for everybody. Certainly, that will initially be more expensive than the way people are heating their homes. Hopefully, it will drive cost reduction in the new systems very rapidly, but we have been



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very cautious about assuming cost reductions that we do not feel confident that we have enough evidence to predict.

Yes, there will be some higher costs there, which is why it ends up as this 1% to 2% of GDP. A surprisingly large chunk of that is the cost of decarbonising the building stock.

Q226 Chair: Mr Stark, at the moment you seem to be focusing on what I would call public money. What about private investment? Does your figure of 1% to 2% of GDP include private investment or is that an assumption that this is taxpayers' money?

Chris Stark: The question of who incurs the investment is one that policy needs to address. There is a really important difference between those investment costs and the costs overall to the economy. The success of the last 10 years in the UK has been a policy that has allowed private investment to come and invest, particularly in offshore wind. That was a policy decision. That could have been managed through direct public spending, for example. It may have had the same outcome, but it would have been managed in a very different way.

Overall, we can see a way of doing this. I want to emphasise something that was discussed earlier. We can just about see a way to manage the kind of transition, in infrastructure terms, that would be needed by 2050. Over 30 years, you can plan for that carefully. If you do not plan for it well, if policy is not put in place at the right moment, then at the end of that period, to meet those targets, you need to start scrapping capital. That is expensive.

The key thing for us, as we look forward, is that it is possible for Government to make a plan for that and for there to be a minimised cost to the economy overall, but the investment challenge over that period is huge. That is something that needs to be planned carefully. I would say that we need the right mix of public spending and private investment and, therefore, the right policies to deliver that. Those are challenges for Government to address. That is one reason why we think the Treasury should have an interest in this and should review it. *[Interruption.]*

Chair: I am sorry. I should have said that Baroness Brown had to leave at 10.45. It was nothing you said, Chris Stark.

Q227 Antoinette Sandbach: In effect, what you are saying to us is that we need the planning and policy environment to be set now, covering the key decisions that will then leverage private investment in the same way we saw in the wind sector.

Chris Stark: That is a very good description of what needs to happen. It does not mean we need a perfect plan out to 2050, but we need to be clear on the moments when we will be doing the big switchovers. We talked about the electric vehicle switchover, for example. We need to be clear on when we are going to start that process decarbonising heat to buildings in the UK. If we do that well, the market will respond and we



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will get this very beneficial cycle, which we have seen, for example, in the last 10 years, where costs fall for the key technologies. If we do not do that well and we wait too long, the costs at the end of this period are much higher than they need to be, and you might then question whether that target is a credible one.

Q228 Antoinette Sandbach: What are the likely impacts on consumers and businesses?

Chris Stark: Again, it is hard to say directly without knowing what the policy would be, but what I would say is that overall we see these costs as manageable. I might define that in this way. 10 years ago, when we offered our advice on the appropriate target, we said there should be an 80% reduction in greenhouse gases. We assessed the cost then as 1% to 2% of GDP. Ten years later, the cost for the 80% target is probably more like 0.3% of GDP. That is because the key technologies have fallen in cost.

The question of how you allocate the costs that are left between consumers, businesses and the public sector is, again, one the Treasury needs to think about very carefully. If they do that, I am very optimistic that we will continue to see the cost falls that we have seen in the last 10 years, particularly if we bring market forces to bear.

Q229 Peter Kyle: Chris Stark, nearly 75% of the reductions that have been achieved in carbon emissions since 2012 have been achieved by sectors overseen by BEIS. Understandably, that includes energy, which has been a massive contributing factor. By comparison, other Government Departments have not been lifting their weight. Look at the Treasury, Defra, the Department for Transport and the Ministry of Housing, Communities and Local Government. What can be done or what did your committee look at to try to increase the ambition of other Government Departments?

Chris Stark: This is really our bread and butter. This is something we in the committee have considered for the last 10 years. I agree with the way you characterise the question. What we have achieved in the last 10 years has mainly been a story of energy and, more specifically, electricity production. The policies that were put in place early on in that decade are now delivering very well. That is a great story.

We would say that more can be done still, even in BEIS, but what is particularly true is that for those other sectors of the economy, particularly for transport, which is now the biggest single sectoral emitter, we have not seen the same focus on emissions that we have seen in BEIS and its predecessor, DECC. The other Department I would throw into the mix is MHCLG, which of course is the housing Department. It is clear that emissions reduction is not given the same priority in those Departments as it is given in BEIS. We need that to shift. One of the things we say in the report is that that needs to be one objective, if not



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the central one, in those Departments, particularly to put in place the plans we talked about earlier in this session.

Q230 **Peter Kyle:** Have you seen the green shoots of priority in these Departments?

Chris Stark: I am very cautious about saying that I have seen the green shoots of anything, but I have certainly seen a response to this report from the Departments in Whitehall that I am not sure we would have seen even six months ago. I am actually very encouraged by it. There is an understanding that this net-zero goal is the right goal but also that it is achievable. Crucially, the policies to deliver net zero are achievable, too, as long as those Departments are given the space to put them in place.

Q231 **Peter Kyle:** Doing a lot of what needs to be done is going to require an infrastructure investment programme on a scale we have rarely seen in this country. Bearing in mind how long it has taken to get HS2, the Heathrow expansion, Crossrail and the 2012 Olympics off the ground, do you have any confidence that we have the capacity to deliver these sorts of things?

Chris Stark: I absolutely have that confidence. In particular for the big infrastructure questions, we have the right framework to deliver it. We have the ability to deliver it. I should put it that way. I am less confident that the objectives will be set for the key actors in those infrastructure frameworks. If you think about, for example, the role of National Grid and Ofgem, how we build our main transport links, just as you have described, all of these things need to be planned with that 2050 goal in mind, and at the moment they are not.

We are particularly au fait with the energy challenges, of course. We have these price control periods where we make investment decisions for key infrastructure that do not look out to 2050. At the moment, they are not even in line with the 80% target. We will need all of the key actors in that space, not just the Government Departments, to think about achieving net zero by 2050. If we do that, it is perfectly possible to achieve the kind of transition we have been recommending in this report. If we wait too long, we will not get there.

Q232 **Chair:** Building on what Peter said, 75% of emissions reductions since 2012 have come from the power sector, but we have seen the announcements in recent months about nuclear not going ahead at Wylfa or Moorside. Is the offshore wind plan for 30 gigawatts by 2030 sufficient to continue to make the progress we need to see in power?

Chris Stark: It is probably just about sufficient. I am sorry to repeat myself, but again there are choices about how we meet that 2050 goal. One of the choices you could make is to go further on electrifying the economy. The more you front-load the strategy of building the infrastructure to deliver low-carbon infrastructure, the better. Thirty gigawatts is the minimum. It is on the trajectory to 75 gigawatts of



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offshore wind, which is the figure we have in here for 2050 as an illustrative scenario. If we were to do more, it would give us more options to achieve things through different routes come 2050. We would certainly advocate that. The rapid scale-up of low-carbon electricity infrastructure is something we would regard as a priority over the coming years.

Q233 Chair: There are two other types of carbon-neutral power generation. The contribution onshore wind is making is falling in the years to come. The Government have also proposed putting VAT on solar panels. Will those policies help or hinder the ability to meet your targets?

Chris Stark: They will hinder it, to put it simply.

Q234 Chair: What do you have in your report about onshore wind, for example?

Chris Stark: I am afraid I do not have the figures in front of me, but, particularly in our technical annex, there is a really good exposition of how we see the power sector playing out. The more onshore wind we have, the cheaper this thing becomes overall. There is plenty of scope—I know this from experience of working in Scotland—for us to build more onshore wind. We have consented sites that are not being developed at the moment. Again, I would emphasise that we will need to throw everything at this challenge, including onshore wind and solar for that matter. Anything that makes it harder is clearly not in line with the net-zero challenge overall.

Q235 Vernon Coaker: In the couple of minutes we have left, a lot of what has been said requires some significant policy. Chris, you used the words “turbo boost”. The costs are quite significant in the short term, whether in industry, heating, or to consumers maybe through their bills, but, as the Chair was saying, in the end the cost comes down.

However, the Treasury are crucial, are they not? There is a spending review coming up. How confident can we be that the Treasury are going to change policy to ensure that the costs are fairly shared, as you point out in the report, between consumers, regions, taxpayers and industry? If it does not do that in the next spending review, the 2050 target will go out the window a bit. Is that right or wrong?

Chris Stark: The next spending review is critical, because it needs to make provision for some of the things we talked about earlier, for example. However, the longer-term questions about how we get to net zero are the grandest of economic challenges.

Q236 Vernon Coaker: If the current spending review does not meet the challenge that is laid out in your report, can the 2050 target be met?

Chris Stark: It is hard to say. That is the short answer. In particular, it depends on how comprehensive that spending review is and the period over which the spending review is done. There has been some discussion about the idea that it might be a shorter spending review.



Q237 Vernon Coaker: Obviously, the report we are doing will help, but what messages are you getting from the Treasury about their receptiveness to the points that are being made?

Chris Stark: Again, I have been pleased, at official level, with the response from the Treasury. It is worth saying that the backdrop to a lot of the work that we do was a piece of work that was done by the Treasury 12 years ago, or it was at least commissioned by the Treasury. That was the Stern Review, which looked at the economics of climate change globally. At that moment, it was a Treasury thing. It was a thing the Treasury wanted to be responsible for. A decade later, there is a moment now for the Treasury to reengage properly with the economics of climate change in this country and indeed globally. If we do that and if it is presented in that way—this is the reason why we have recommended that there is a review that is undertaken by the Treasury—the costs of this can be managed and allocated in a way that does not impact on the economy negatively.

Q238 Vernon Coaker: The crucial part of it—again, you mention this in your report when you talk about public acceptance—is that, in the end, people individually have to change their behaviour. Individual decisions will have to be made, and policy will have to be changed to encourage that. At the end of the day, as we have seen in some of the public polling that has taken place at the moment, people agree with tackling climate change, but, without being cynical, if you are going to pay £50 or £100 more on your petrol, it starts to become difficult for people. It starts to become difficult if their jobs are going to go.

Chris Stark: You are right about that.

Q239 Vernon Coaker: Where are we with that? We talk about the need for public acceptance. How is that generated?

Chris Stark: There are a few things to say to that. First, in the main, the decarbonisation we have achieved over the last decade has been done without that engagement with consumers and citizens. That is because, when you flip the switch in your kettle now, it still boils. It does not matter that more than half of the electricity that is being supplied to your home over the course of that year is low-carbon. The next stage of this will require a different kind of engagement, not necessarily a negative one. I want to make this point. It means that we might be driving cars. That is a good example. If you have a smarter home-energy system in your home, that means it might work differently, if it heated with a heat pump rather than a boiler. It is worth saying that it is important that we make provisions for that and we plan for it.

You are absolutely right to say that, if we do not manage it well, there are negative impacts. In the past, over the course of these big transitions, especially from heavy industry to the kind of economy we have now in the UK, we have seen that they have not always been managed well. One of the recommendations we make is not just that the



Treasury should review how they approach the costs but also this idea of the just transition.

Q240 **Vernon Coaker:** If it is a job or the dole queue, it is not much of a choice, is it?

Chris Stark: We need to plan for regional impacts on industry, for example. Again, it is perfectly possible to do that, but it needs a proper plan. We are saying very clearly to Government, "Make a plan for that, because we know the things that will happen over the next 10 to 20 years at least". We can plan well for this, and we can see employment impacts in the right places in the UK if that provision is made. If we lurch into this, if we set, for example, a target without making a plan for those things and without consciously entering into it, then we will have damaging impacts. I would question whether there would be the public support for it that will be necessary over the next 30 years.

Chair: Thank you very much to both of you for coming to give evidence. Thank you also to Baroness Brown. You have been very informative.

Examination of witnesses

Witnesses: Nick Molho, Will Webster and Nick Robins.

Chair: Thank you very much to the three of you for coming to give evidence this morning and for sitting in on the earlier session, which I hope you found as informative as we did. The questions will kick off in this session with Peter Kyle.

Q241 **Peter Kyle:** Will Webster, what did you make of the previous panel? What did you make of the climate change report and the UK's declaration of a climate change emergency?

Will Webster: In Oil & Gas UK, we have around 20 production and exploration members and around 300 contract companies. Overall, we saw the report as quite a positive and balanced blueprint for a net-zero future. We saw that the projections that were made in terms of the consumption and production of oil and gas were roughly consistent with our expectations. As oil and gas producers, we produce around 60% of what the UK needs, and we import the rest. Essentially, what we produce is competing to displace the imports. We do not see ourselves as competing against alternative technologies in any way.

Q242 **Peter Kyle:** You agree with the conclusions, you agree with the scale of the ambition and you agree with the impact it will have on your sector.

Will Webster: I cannot speak for all of our companies and say that all of them agree with every word in the report, let us say, but, overall, it is certainly a large challenge and it is one the sector views positively. We think the oil and gas sector has a lot to offer in that respect.



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Q243 **Peter Kyle:** Do you agree with the scale of ambition for decarbonisation outlined in the climate change report?

Will Webster: We saw it as a balanced piece of work. We saw it as a blueprint. Whether that will necessarily happen or not—

Q244 **Peter Kyle:** Could you answer directly? Do you agree with the scale of the ambition outlined for decarbonisation outlined in the report?

Will Webster: We are not here to give advice on that. The Government asked the Committee on Climate Change for advice, and it has given its advice. We are still digesting some of the implications of the report, but overall we can see the direction of travel and we are happy to positively engage with that.

Q245 **Peter Kyle:** From your answer, though, it sounds as if you are not that enthusiastic in supporting it. Therefore, there are going to be aspects of it that you are going to be resisting.

Will Webster: Yes, we would possibly put a different emphasis on different things, on particular subjects. For example, we probably see a bigger role for decarbonised gas in industry and domestic households, given our heritage and the use of gas.

Q246 **Peter Kyle:** You would only do that if you agreed with the overall finding that we need to decarbonise on the scale outlined in the report. If you do not, you would be pushing other sectors as well that are not leading towards decarbonising.

Will Webster: The direction of travel is very clear. The gradient of the slope, in terms of how quickly you go, will come out of this process as we go through it.

Q247 **Peter Kyle:** Nick Robins, what impact is this already having on the business sector? Are businesses already planning on carbon reductions overall? Are there some sectors that are leading? Are there others that are trailing? Are investors scanning the horizon to see how they should be adjusting?

Nick Robins: I will speak very much about the finance sector. This report has been very broadly welcomed. In terms of investors, the insurance sector in the UK is very concerned about the impacts of climate change. Aviva has just published its response on climate change disclosure, which says that only under the very ambitious 1.5 degree scenario will they have a positive outcome. Warming really matters for the finance sector.

The finance sector is already looking forward to see how they can try to align their portfolios and starting to shift portfolios more into green assets. The big problem there is that the pipeline of investible assets is not big enough, so having a plan like this is important. Secondly, they are also exerting their role as shareholders, for example with Shell recently, to make sure that the capital that these large companies hold is, again,



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aligned. The recent decision by Shell to leave some of its trade associations because the trade association's lobbying position was not in line with this is very important. The finance sector very much gets this. Obviously, we would like to see this translated into the incentives that are going to drive capital at the scale and speed that is important.

If I may add to that, we should also recognise that this transition is not just an environmental transition; it does need to have a strong social dimension, as we heard from Chris Stark in the last evidence session.

Nick Molho: In terms of the effects on the business side, we are seeing many businesses adopting net-zero targets. If you look in the retail sector, big players like Tesco now have a science-based climate target aligned with 1.5 degrees of warming. The John Lewis Partnership recently announced an objective to make all its operations carbon-neutral by 2050. If you look at the manufacturing sector, at a global level, Siemens have a carbon-neutral objective for their operations that they want to reach by 2030. In the steel sector, Tata Steel has a carbon-neutral objective that it wants to deliver at the European level by 2050. There is a lot of momentum.

Q248 Peter Kyle: When you see the implications of the climate change report and you see in the last week Parliament declaring a climate change emergency and you see the direction of travel that Government, experts and Parliament are taking, it is accelerating. It is not becoming more relaxed going forward; it is accelerating in its ambition. On behalf of the private sector, do you see more opportunities emerging from this or do you see more challenges emerging from this?

Nick Molho: We see opportunities if we play it right. If you look at the size of our low-carbon economy today, there are just under 500,000 people employed in it. We have existing strengths today in offshore, electric vehicle manufacturing, green finance, energy-efficient building and engineering and so on. In terms of the current projections, it was estimated in a report done by the CCC last year that the share of the low-carbon economy as part of our total output could grow from 2% today to 13% by 2050. That was predicated on an 80% target. If we strengthen the target and move to net zero by 2050, you would imagine that it would require us to make early-move investments and innovation trials in new technologies such as carbon capture and storage, hydrogen, biofuels for aviation and shipping. All of that then increases the areas where the UK could build competitive advantages.

Q249 Peter Kyle: What about businesses that are rooted in communities and that are not following public policy? They might not even realise that their businesses are involved in a supply chain that emits a lot of carbon. They might not be looking precisely at what their contribution is. Nick Robins, you are shaking your head.

Nick Robins: I was trying to nod, actually.



Peter Kyle: I am sorry, I meant “nod”. Your head was moving.

Nick Robins: This is a very important point, because, on the downside, SMEs in particular supply chains, such as diesels, that are one-product companies and that do not have the foresight and so on are more at risk. That is why we need to think about some of the public finance institutions. We have the British Business Bank, which is focused on SMEs. More could potentially be done there about the way in which they can support SMEs? There is also the question about what we would need if we do not have the EIB as well, which obviously provides a lot of capital into the SME sector.

Nick Molho: We have an interesting blueprint to follow in terms of what has happened in the offshore-wind sector. We had a situation there where Government, local enterprise partnerships and manufacturers such as Siemens and MHI Vestas worked at the local level to ensure that forthcoming investment would go towards SME contractors. You have seen that happening around Siemens’ offshore hull and blade manufacturing facility and the same on the Isle of Wight with MHI Vestas. That is where we really need to take an Industrial Strategy approach towards this.

However, there is a broader competitiveness point that is important to make. A month ago, we published a report on the business implications of net-zero emissions. That report came about from extensive engagement with a wide range of sectors, including hard-to-treat sectors such as steel, cement, food and aviation. What was clear from that engagement was that there was real business appetite to have a net-zero target and to seize the industrial opportunity it presents, but the key concern from industry was to ensure that, if they innovate and develop new low-carbon products and services we need, such as ultra-low-carbon cement and ultra-low-carbon steel, they must not then be undermined by high-carbon imports that could completely undermine their upfront investment.

One of the policy measures we suggested in our report was to introduce product standards for building materials such as for ultra-low-carbon cement and ultra-low-carbon steel, which would set a clear policy direction, grow the market demand for those products but ensure that British industry is not undermined by high-carbon imports that do not abide by the same standards. We really have to have a holistic view about that at the outset.

Q250 **Antoinette Sandbach:** That leads on to the idea of how decarbonisation may affect the competitiveness of UK businesses. What support is needed to deal with the hard-to-treat sectors of the economy, including those where businesses are trying to take the lead, like UK agriculture, where they are setting targets?

Nick Molho: There are three key aspects to that. First, we need to innovate at scale. When we consulted with a wide range of businesses,



one piece of common feedback was that the UK's innovation policy seemed to be marked by a fear of failure. Too many of our innovation pots tended to be too small, too fragmented and often subject to change. If we are going to decarbonise big chunks of industry and big chunks of our heating and transport sectors cost-effectively, it is clear that we need to get on rapidly with innovative technology such as carbon capture and storage and hydrogen at scale. Innovating urgently and at scale is the first thing.

The second one is making sure that we introduce clear policies to grow the long-term market demand for ultra-low-carbon goods and services, bearing in mind the competitiveness concern that I was highlighting earlier on. That is essential to get private-sector investment in innovation and commercial rollout. Without the guarantee of a market, it will not happen. My last point, if I may touch on it briefly, is around trade. If we are to have an independent trade policy after Brexit, we need to make sure that trade policy serves to deliver the net-zero target as opposed to undermining it. We need to make sure we encourage others to get on board with the net-zero agenda and promote actively low-carbon trade in services.

Q251 **Antoinette Sandbach:** Is that realistic, Mr Robins? It seems to me that we might just offshore our carbon emissions by importing from other countries.

Nick Robins: That is a concern. There are a number of recommendations in the Committee on Climate Change report such as a border tariff adjustment. We had our own independent policy. The product approach is also very important. There could be international legal issues within the WTO. However, we have to make sure that this is not an offshoring. One of the things we hear is that people are very keen on the transition and they can see the benefits, but this has to be fair internationally. The report makes the direction of travel very clear: this is not going to be an offshoring strategy. That points to the role of international leadership.

Q252 **Antoinette Sandbach:** That is something that should be addressed at the next COP.

Nick Robins: Exactly. For example, in China, on the finance side, the UK has very strong links with China on the Belt and Road Initiative, its massive infrastructure project. It is those sorts of partnerships that could mean that those exporting nations are lined up.

Q253 **Antoinette Sandbach:** Mr Webster, do you have a view about the energy-intensive industries?

Will Webster: Yes, we do. A lot of this is about the balance between the positive incentives and the negative ones, if you want to put it like that. We have experience of EU ETS. That is a good, stable and visible set of negative incentives around what the mission should be. To a certain extent, that is something industry is quite familiar with and is used to dealing with.



Q254 **Antoinette Sandbach:** As a sector, are you are going to be dealing with reduced demand for oil and gas globally, or do you just anticipate exporting more of it as demand falls in the UK?

Will Webster: We are net importers in the UK at the moment. Of the 150 megatonnes of oil equivalent that the UK consumes per year, we only produce around 90. We would say that we are used to EU ETS and we are familiar with it, but a policy based on additional obligations for our sector would make that position worse and it would make the whole endeavour quite unstable and precarious from a wider energy-policy perspective.

I would also pick up on something else. What we really need to do is harness investment in new sectors. For us, that means that the incentives largely have to be positive ones about why you should invest in these new sectors. That has to come from the regulatory and financial framework that is developed as a consequence of any targets. Using offshore wind as an example, there was a shift from the renewables obligation to the CFDs. The renewables obligation was an obligations-based policy that worked to a certain degree but had some shortcomings, in that everything had to go through the companies that had the obligation. The contracts for difference were backed up with a levy control framework that really gave positive incentives for a new group of investors to come in and to deliver the capacity that has now been quite a success. We see a need to learn from that experience, which I hope everyone has, in developing policies around the CCC's report.

Q255 **Mark Pawsey:** I am sorry for missing the first part of the panel. I want to focus on Professor Robins, if I may, because I know you have done some work on the role investors can play in helping the environmental and social dimensions of the move to net zero. What actions should Government take? How can we ensure there are not social impacts?

Nick Robins: One of the very welcome contributions in the Committee on Climate Change report was the recognition that this transition is going to be large and it is a huge opportunity for this country in so many ways, but we actually have to make sure that it is fair and that it is seen to be fair. We have to ensure that it is a just transition, to use the phrase in the climate change debate.

This means a number of things. The workers and communities who are affected by these decisions on the upside or the downside need to be involved. Their voices need to be heard. It needs to be very place-based. We obviously have a number of industries that could be affected, whether that is oil and gas or others, that are in particular places. We are working in the Yorkshire and Humber region and looking there. There are obviously a lot of strong sectors there, so it needs to be very place-based. This does make a consideration that we need to think about the capacity of local and devolved Governments to deal with this.



There is also a skills dimension to that. We really need to rethink the skills strategy. Mr Kyle, this goes back to what you were saying earlier. We need to think along supply chains. Often, most large companies can now make the transition—whether they will is another thing—but we really need to think about the smaller businesses, which, as we know, are the great generators of innovation and employment. This is the newest area for Government to focus on. We do not have as part of our policy architecture a particular strategy for managing the social side, the upside and the downside. I would say that this is a particular area to consider.

Scotland has a Just Transition Commission, which has been set up to consider this. It is quite new. It may be an area for further consideration. Do we need a particular new body or a new initiative? Do we need to integrate this into all the various sector strategies?

Q256 Mark Pawsey: There will be some areas and some industries that are affected more significantly than others. My constituency contains a cement manufacturer, and I have learnt from Mr Molho just now that there is such a thing as low-carbon cement; I was unaware of that. How do we encourage the workers in the cement plant in my constituency to embrace the proposals of the Committee on Climate Change?

Nick Robins: As we know, employees have the best ideas. They know how these things work. We have to make sure they are involved in terms of strategies. There are some good examples starting to come out, particularly in the electricity sector, such as the Italian company Enel, of companies making sure there is that involvement. We have to think about the spillover impacts, and we cannot just look at those—

Q257 Mark Pawsey: I understand, but how are we going to convey the broader issues to those who are immediately affected? We could talk about steel workers in south Wales, for example. How are we going to get them to embrace this change? They may be bothered that the proposals contained in this document are going to be harmful to their future incomes and jobs?

Nick Robins: That is going to happen at so many levels, is it not? It is going to happen at the workplace level, the sector level and the national level as well. Much of the potential is going to come at very strategic technological pathways, as we have heard, in terms of what the different options are. However, what we have picked up in the work we have been doing with the University of Leeds, with investors and the TUC is a sense of how we can overcome the sense of anxiety about this, that maybe this transition could be like previous transitions and it could lead to rough spells. We need to think quite carefully about different mechanisms of involving people in decisions.

Q258 Mark Pawsey: You refer to the Just Transition Declaration. Should that be incorporated into documents like the Industrial Strategy and the Clean Growth Strategy? Should it be a fundamental part of our thinking?



Nick Robins: It needs to be, yes. The Clean Growth Strategy points to the importance of people and place, but largely in the sense of skills and production. This just-transition element needs to be there. The UK signed up to the declaration, which was launched in September. This is a natural next step, and that would be a new building block. It should also be incorporated into some of the sector deals, for example in oil and gas and so on.

Q259 **Mark Pawsey:** Mr Webster, is the workforce in the area you represent likely to be sympathetic to the document we are discussing?

Will Webster: We should see our industrial sectors—oil and gas is no exception—as the platform for the transition, including all of the expertise we have. A lot of the skills people have are transferrable across different sectors. We are talking about safety, where we are at the forefront in a lot of areas across different industries, or project management, et cetera, in terms of dealing with large-scale processes.

These are things that can be developed from our industrial sectors, including the oil and gas sector, into some of these new technologies. We also have specific things like CCUS and hydrogen. Some of those things are core to what we are doing already. We are moving gas around in pipelines already. If we are moving a different gas around in a pipeline, there are some consistent things, although gases have different properties, et cetera.

As I said, it is a challenge that we should be viewing positively from the top of the businesses right down to the people working in those sectors. In terms of what people need to see, for example, if you are going to do a training initiative on a new technology, what you have to see to engage in that is a really long-term and positive framework for that particular sector. That is something we have been used to over 40 or 50 years in the oil and gas sector, which is a UK success story. We need that kind of thinking behind some of these new technologies that are going to be needed, and particularly CCS and hydrogen. I know colleagues have already talked about that, but it is going to be an essential part of delivering CO2 reductions.

One of the scenarios in the CCC report uses 175 million tonnes per year of carbon capture, which is about half of what we emit now. That is essential, according to the report. That is a key area. Carbon capture is a new industry that needs to be developed. It cannot just be bolted on to other sectors. This is the sort of thinking that needs to be done as a consequence of adopting targets.

Nick Molho: I would add one example on Mr Webster's point about transferrable skills. It is worth pointing out that in 2017 a third of the engineers in the marine renewable energy sector came from the oil and gas sector, precisely because of that essential knowledge.



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The other point also worth noting in the heavy industry sectors such as cement and steel is that a net-zero target also offers the prospect of growing those industries, if we take a leadership role in the manufacturing of much lower-carbon cement and steel. In fact, one of the representatives of one of those industry sectors in one of our workshops made the point that this is an opportunity to bring the jobs back, if we take a quite decisive approach towards it.

If you look at what is happening in Rugby, for example, that is the largest cement production site in the UK, operated by CEMEX, they have a partnership with SUEZ, the waste-handler located just next door, whereby the industrial and municipal waste treated by SUEZ is turned into a fuel that can then be used in the cement kiln next door. That significantly reduces the amount of waste going to landfill and the carbon emissions in the process. We need to see more of that, but we are in a good position to build from.

Q260 Mark Pawsey: Are you saying that the cement manufactured in Rugby is low-carbon cement by virtue of the alternative fuel?

Nick Molho: Yes. It has already reduced its carbon emissions thanks to that partnership, and that delivers gains not only on the carbon agenda but also, importantly, on resource efficiency, which is another big Government priority.

Q261 Mark Pawsey: Maybe they should stick that on the label of the packaging.

Nick Molho: If we go down the line of product standards that I was highlighting earlier, we might well move in that direction. It is important that we are clear on what is and is not acceptable in terms of products that can be sold on the UK market. We have to make sure that both individuals and consumers know what they are buying and make sure that we set a level playing-field in the process.

Chair: I feel so much more knowledgeable about Rugby.

Q262 Antoinette Sandbach: Mr Webster, I wanted to come back to you around the view of the oil and gas industry. Your 2018 report said that continuing maximising economic recovery in the UK is consistent with the UK's climate change legislation and targets. Obviously, that was before the recent climate change report. Is that the case with the net-zero target? I appreciate what you have said about the transferability of skills, but would oil and gas priorities then change with a net-zero target?

Will Webster: They would not change too much. That statement would still stand as far as we are concerned. Essentially, we have two timeframes. We have one over the next 15 years or so, Vision 2035, as we call it. That is about maintaining production from the North Sea and adding another generation of expertise and output. However, that will still leave us quite a way below what we are today in terms of what we produce. We currently produce about 90 million tonnes of oil equivalent;



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we will probably go down to about 60 million tonnes. Those will still be displacing imports, because while our consumption of oil and gas is at 150 tonnes today, by 2035 it will probably come down a bit, but maybe not that much. A big chunk of our oil and gas needs will still be met by imports even in 2035. That is the first timeframe; that is the need to maintain what we have.

The 2050 timeframe will be more about the transition. Production will probably decrease further after that. As I said, the CCC projections look at a reduction of around 80% from where we are today. That is probably a bit more than we have, but they are not particularly different in terms of the order of magnitude. As this report says, we will still be consuming a lot of fossil fuels, particularly gas. There will just be different ways of using it in a decarbonised way.

Q263 Vernon Coaker: Can I ask a little bit about what more the Government can do to bring investors and business on board with the net-zero agenda? If we start with finance, I wonder whether there are examples from abroad that we could copy here. Let me just ask this question as well about investment. Given that billions of pounds are invested every year, how do I know or does anybody know whether their bank, investment company or pension fund is investing in a net-zero agenda? Will people publish that? Is that amount going up? Is it going down? Does nobody know? What is going on? Do we have any examples from abroad that would help us?

Nick Robins: It is a very good point. This is where there has been a lot of progress. There is an international framework on disclosure called the TCFD, which has been voluntarily adopted both by—

Q264 Vernon Coaker: How does Sid Smith in the midlands know that?

Nick Robins: Exactly. This is at the institutional level. Companies talk to investors and it is all very internal. We have to make a translation here. We now have auto-enrolment, for example. It is a great success story. That annual statement you get should be very clear about the risks but, as you say, also in terms of the net-zero alignment. You have this at the institutional level, which the individual person will not see, but for Sid Smith you need to have this on those statements and on your ISA plans and so forth. That is the translation. Overall, disclosure is largely voluntary. It needs to be mandatory.

Q265 Vernon Coaker: That is very interesting. You would support a Government policy that introduced mandatory disclosure of the consistency of an investment portfolio with the net-zero agenda.

Nick Robins: Yes. We have a focus on the risks side, but this alignment needs to be there. We talk a lot about costs, but ultimately it is going to be the citizens of the UK who are going to be paying for this, whether it is out of their taxpayer pocket, their consumer pocket or their savings pocket. It needs to be very clear to them, and then they can drive that behaviour, whether it is the supermarkets or their pension fund



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managers, to make sure these things are aligned. As I say, we now have all this digital technology. It is not going to be a complicated thing to do. That should be our aim.

In terms of examples abroad, in France there is a mandatory law in terms of reporting by the financial sector. That has been a huge driver. Interestingly, France and Paris have said that it has been a driver of innovation. It has not been a regulatory burden; it is driving them to develop the investment products that people around the world need. Seeing regulation as a driver of competitiveness certainly works in the finance sector.

Nick Molho: On the finance side, the Government are due to publish a green finance strategy this summer. We would want to see in it a reference to the mandatory introduction.

Q266 **Vernon Coaker:** Do you support mandatory requirements as well?

Nick Molho: Yes, absolutely. We would like to see that in the green finance strategy that is due this summer.

In terms of what other non-investor businesses need and what we can learn from abroad, first of all, taking a step back, setting a target sooner rather than later is important in terms of achieving net-zero emissions. We are talking about businesses investing in changing business models and in high-capital-cost infrastructure that will be around for a long period of time. Before making investment decisions like that, you need to understand where policy is going.

What the Swedes did when introducing their net-zero target for 2045 was to work with a wide range of industry sectors to ask them to prepare roadmaps as to how they were going to deliver their contribution towards net-zero emissions. To date, 11 sectors have published those roadmaps in co-ordination with the Swedish Government. For example, the Swedish construction and civil engineering industry wants to halve its climate impact in the next 10 years and be completely net zero by 2045. The aviation industry has committed to net-zero domestic flights by 2030 with all flights leaving Sweden being net zero by 2045. It is a really good example to follow.

Q267 **Vernon Coaker:** Is that a voluntary target they have set themselves with respect to the emissions?

Nick Molho: The Swedish 2045 target is backed in legislation. The roadmaps were developed underneath it to provide sectoral clarity for industry, in terms of both big businesses and supply chain companies, to understand where the market was going, where innovation was needed and what the demand for different products and services would be by particular dates.

You need that clear picture. In the UK, we could build on the recent sector deals to get there. If you look at things like the sector deals in the



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automotive industry and offshore wind, there is a good basis to build from there. However, then you move to the policy space. This goes back to some of the points I mentioned earlier: we need to up the ambition of our innovation policy quite urgently and quite significantly, trialling some of the key technologies we know we will need now and at scale. We need to combine our innovation policy with a clear market-creation approach, which requires well-targeted regulations and well-targeted fiscal incentives to grow the demand for low-carbon products and services.

An example Baroness Brown touched on earlier is that we are in a really bad place when it comes to buildings at the moment. We should not be, because it is not the most complicated part of the challenge, at least as far as energy efficiency goes, but we are. That is mainly down to the fact that we have very poor regulatory drivers. If we have an aspiration to bring the energy efficiency of homes to EPC band C by 2035, we should really have a binding regulatory driver to achieve that and we should have very effective fiscal incentives that we know householders will respond to, such as stamp duty rebates to trigger that investment. We need to combine that long-term target with an ambitious innovation policy and a market creation policy that works hand-in-hand with it.

Q268 Vernon Coaker: Mr Webster, I do not want to be a hypocrite because I want diesel in my car to drive it and I want to turn my gas on at home to cook my food and so on and so forth, but we are all in a moral dilemma with that. For years, I bought unleaded petrol because I was told that was a good thing to do. People bought unleaded cars. I bought a diesel car because I was told it was the right thing to do and I put diesel in it, et cetera, in the belief that that was a good thing to do.

From a business perspective, this is difficult. You represent the oil and gas industries, and people want oil and gas. What could Government do to help you achieve the net-zero agenda, as Mr Kyle was saying? There is a sense in which people want climate change tackled more enthusiastically and with more urgency, and that is going to be a big burden on you. That is why Mr Kyle was pushing you on net zero, because it is a real challenge for you. How are you going to demonstrate, with Government, that you are taking this seriously and pursuing the net-zero agenda in a way that is consistent with the fact that you are an oil and gas business?

Will Webster: Yes, it comes back to the disclosure and transparency point in one respect.

Q269 Vernon Coaker: Do you do that automatically? What do you do, not you personally but oil and gas, to persuade people of this? How are you going to demonstrate to people that you are doing green stuff? British companies are pouring into the Falkland Islands now—I was there a few weeks ago—to look at what can be done. It is a pristine environment. They are in the Arctic as well. How are you going to demonstrate this to people? What will Government need to do, if you will not do it voluntarily, to force you not to ruin the environment?



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Will Webster: The point about disclosure, corporate social responsibility and transparency is something that companies have got used to, and they are going to have to get used to a whole load more of that, I would say. I would add one point of caution. We should not put these things totally in black and white. I am here to talk about the CCC report, but the world still needs energy; it needs a lot of energy.

Vernon Coaker: That is why I started the point with—

Will Webster: The availability of energy is one of the UN Sustainable Development Goals. Energy companies support economic development across the world, so we should not forget that before we get into this.

What should Government do to help investors realign what they are doing? There are questions about market design that are quite important. All energy markets have a degree of design about them. There is a degree of Government involvement, regulation and regulators around most of the things that different energy market companies do. There is a role in looking at how that will change to make things like CCS and hydrogen happen. For example, outside of our sector, if you want to be a supplier of hydrogen, how would you be regulated by Ofgem? Would there be the same regulations we have today for natural gas, for example? There are questions like that. They are quite abstract questions, actually.

The other thing I would underline is that it has to be more on the side of positive incentive to harness investment rather than how the industry can be forced to do something, because being forced to do something leads to the industry not engaging with the whole topic and doing something else with their investment, if you are not careful. That would threaten some of the objectives that we are trying to achieve.

Chair: Thank you, all three of you, for coming to give evidence to our Select Committee this morning.