HOUSE OF COMMONS

Environmental Audit Committee

Oral evidence: Climate Change Adaptation, HC 453

Wednesday 21 January 2015

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Written evidence from witnesses:

– Committee on Climate Change

Watch the meeting:

Members present: Joan Walley (Chair), Neil Carmichael, Martin Caton, Zac Goldsmith, Mark Lazarowicz, Caroline Lucas, Dr Matthew Offord, Mrs Caroline Spelman, Dr Alan Whitehead, Simon Wright.

Questions 236–291

Witnesses: **Lord John Krebs**, Chair, Adaptation Sub-Committee, Committee on Climate Change, **Matthew Bell,** Chief Executive, Committee on Climate Change, and **Daniel Johns**, Head of Adaptation, Committee on Climate Change gave evidence.

Q236 Chair**:** May I first of all apologise for keeping such distinguished witnesses before our Committee waiting? We did have important business to discuss, not least on fracking, so I am very grateful to you indeed for waiting. We do understand, Lord Krebs, that you have to leave at 4 pm.

Lord Krebs: I am afraid I do, yes.

Q237 Chair: We expect to finish by that time, too.

Thank you for coming along. I think, in recognising that 2015 is going to be a big year in all kinds of ways, not least in respect of the report, which is expected by July 2015, we wanted to start by asking you to what extent you feel the Government are, in reality, addressing the priority climate risks identified in the assessment.

Lord Krebs: Thank you very much, Chairman. Shall I kick off and then invite the others—

Chair: Please do and, as you are aware, this is the fifth session that we have had out of six. We will be having Government Ministers, so this afternoon's evidence session is clearly really important.

Lord Krebs: Yes, so the answer to your question lies in looking at the National Adaptation Programme, which sets out the Government's programme for responding to the risks identified by the Climate Change Risk Assessment. As you correctly say, Chairman, we will be reporting to Parliament on the NAP in July, but to give you a sneak preview of our thinking, we have compared the NAP with the Treasury Green Book guidelines on how such a document should be structured: does it have a clear rationale; does it have clearly defined objectives; is it measurable; can you evaluate it and so on. To put it at its baldest and briefest, we think that although the NAP has a large number of objectives, and an even larger number—370 or so—of actions, many of those are difficult to measure. It is not clear who is responsible for them, and it is really more a description of what is happening, rather than a strategy for preparing for climate change in the future, so it is not introducing new priorities and activities.

I think another important element that is missing is that although it has this large number of objectives and actions, it does not give you any sense of where the priority risks lie. So I think the short answer from the NAP is that when we get to write our report, we will be quite critical of its ability to deliver a country that is prepared for the impact of climate change.

Having said that, perhaps one mitigating factor is that it is the first time that the Government have tried to produce a NAP, so perhaps the way to look at it is this is a learning experience and maybe the next one will have a sharper focus, will respond to the criticisms that we will raise, and will have measurable, effective actions that will help to prepare the country.

Q238 Chair: Thank you. Given that it is, as you said, a learning curve, do you think the fact that you have produced interim reports as part of the policy process will give us a strategic approach at the end of this process? Do you think that those interim reports and the changing events as time goes on are helpful towards getting the right outcome at the right time?

Lord Krebs: I hope so. The point of those interim reports was to expose to everybody—stakeholders, Government, civil service officials and so on—how we were intending to evaluate whether or not the country is preparing for climate change. Right from the very beginning we said, "Where possible, we want to focus on measurable actions and particularly actions that result in outcomes, as opposed to processes that can be measured in terms of the country becoming better prepared for climate change". I will ask Daniel to comment on this, but I think in the interactions we have had with Defra, there has been a shift in its thinking to recognise that this approach of having clear metrics that you can look at, and having metrics that will look at outcomes as well as processes, has begun to influence thinking.

Daniel Johns: I am Daniel Johns, Head of Adaptation at the Committee on Climate Change. My role is really to lead the team that supports the work of the Adaptation Sub-Committee. As Lord Krebs says, certainly it is a learning process. We hope the progress reports that we have published to date have been useful. Certainly, the committee itself had to put its mind around exactly how to approach the task of assessing preparations for climate change, and certainly we expect the next version of the adaptation programme to be clearer in its sense of priorities and clear in its sense of how demonstrable progress can be measured.

It is also worth saying that the National Adaptation Programme builds on the work of the Climate Change Risk Assessment, the first one of which was published in 2012, and the Adaptation Sub-Committee has been asked to prepare the next Climate Change Risk Assessment, which is due in 2017. We hope that that second Climate Change Risk Assessment will, again, have a clearer sense of priorities and show where action is being taken to adapt to climate risk; and, as a result, show the remaining urgent risks that need to be addressed?

Q239 Chair: On a scale of one to 10, where 10 is very good, where do you think the Government are in terms of their ability to implement strategically where you are so far with the evidence that is coming forward?

Lord Krebs: Shall I have a first stab and the others will come in? I would say, looking at the NAP, well under five, and probably in the two to three range. Am I being too harsh, Daniel?

Daniel Johns: I think again we have to recognise that the UK is one of the first countries to have a statutory basis for both mitigating climate change and adapting to climate risks. So we have to recognise that within the UK and England—as the National Adaptation Programme is primarily a document that is concerned about progress within England—the fact that we have a National Adaptation Programme, and the fact that it is comprehensive in terms of its objectives and its actions, should be welcomed. We have to recognise we do have—

Q240 Chair: Sorry, I am not asking whether it is right that we have it; the purpose of my question is to say that now that we have this buy-in to have it, and we are on the journey of doing it, obviously it has to be done to the best of our ability, so what is the distance between where the Government are currently at and where perhaps they might need to be? Or do we just leave it at we have had perhaps one—

Daniel Johns: Well, I think at that stage you probably need to break it down into the constituent parts and the climate risks that you are interested in: how are the Government doing on water scarcity; how are the Government doing on flood risk management; what are they doing about preparing natural habitats and biodiversity for the changes we can expect?

Q241 Chair: We will drill further down into some of those later on, but in terms of how you think the adaptation policy needs to be strengthened by the Government in the next National Adaptation Programme, what would you say the main priority was there?

Lord Krebs: I think—again I will ask Daniel and maybe Matthew to come in if they wish to—the key things that need to happen as we move from NAP1 to NAP2 is to have more of a top-down, prioritised strategic approach, because the way NAP1 was generated was essentially bottom-up. It was what Defra called co-creation, which means you ask a lot of people what they are doing and then you summarise that in a document—"and this is what is happening". That is fine. That is good because it generates buy-in, but at the same time I think if you are going to change the pace and take this very long-term view that we need to take, reflecting all the uncertainties, it will require more of a top-down approach. So it is going to be a bit more top-down, it is going to be more clearly prioritised and the actions that are identified in NAP2 should be measurable so that we know whether they are being implemented. It should be clear who is responsible for them so that we can point the finger if nothing is happening, and there should be actions that focus not just on process—because civil servants tend to be very good at process—but on outcomes: what actually are we doing that will lead to a country that is more resilient through a range of uncertain futures, but ones that will be very different from the present. So that would be my take. Daniel, do you—

Daniel Johns: Absolutely. The National Adaptation Programme essentially references a whole suite of existing Government policies. To our knowledge it did not in itself contain any new Government policy, or any new allocation of Government funding or resources. As you might expect, a programme usually is a discrete set of activities overseen by some kind of governance arrangement with resources to allocate as those priorities change, whereas, really, the National Adaptation Programme is a collation of existing activity within a summarised document.

Q242 Chair: You talk about top-down. We had a visit to the Committee from some Canadian delegates yesterday very much looking at policy—and regional policy. Given the constitutional debate that is taking place in the UK at the moment, what is the lesson from the devolved Administrations in terms of how this fits into the overall policy and the experience that they may have in terms of best practice?

Lord Krebs: I think one thing to say is that obviously there could well be regional differences in the impacts of climate change on the UK, so thinking at the right spatial scale is very important. In terms of what is happening in the devolved Administrations, certainly Scotland has a Climate Change Adaptation Plan, which we have been asked to comment on by the Scottish Government, and they have, I think, very much engaged the academic community—through a programme called Climate Exchange, which involves people from universities and from Government institutes, including the James Hutton Institute—in drawing together the evidence base that will help Scotland to adapt to climate change. When we were doing the second Climate Change Risk Assessment, we were also trying to draw on the expertise of the academic community more widely, so that might be one learning that Scotland has tried to maximise, utilising the expertise it has within the country.

Daniel Johns: If you compare the National Adaptation Programme, which is primarily for England, with the Scottish Climate Change Adaptation Programme, which came out last year, there were seven themes within the English NAP and only three themes within the Scottish Climate Change Adaptation Programme. In general, it is a more focused, concise, targeted, prioritised document where you get a better sense of where—

Chair: The Scottish one is?

Daniel Johns: The Scottish one, yes. It has clearer outcomes and a clearer sense of priorities, and, yes, it is easier to measure on the basis of the evidence that would be available.

Q243 Chair: So there are lessons to be learned there?

Daniel Johns: Yes.

Lord Krebs: Perhaps, Dan, you could come in on what is happening in Wales and Northern Ireland.

Daniel Johns: The Northern Ireland Executive have their own adaptation programme, as does Wales. The Welsh one is statutory in the same way as the English and the Scottish ones are, but there are now adaptation programmes there taking place in each part of the country.

Matthew Bell: Speaking on behalf of the broader committees—I am the Chief Executive of the Committee on Climate Change—we are actively working with each of the devolved Administrations. The main committee is holding its January meeting in Edinburgh. I am going up there tomorrow to do that. We are holding one in Wales in April, and following that in Northern Ireland and so on. In terms of learning the lessons and trying to make sure that we can compare and contrast the different parts of the UK, it is something we are putting a lot of effort into.

Q244 Chair: Lord Krebs, you talked about it being top-down, but in terms of how the information is coming out and the plan that is being drawn up, what is your experience of Government Departments and their heads? Is there awareness in the civil service out there about this? In the first round was that done very easily, or do you have to remind them ad infinitum about the importance of this? Is it something that everybody is signing up to with great enthusiasm, or is it a little bit harder going than that?

Lord Krebs: I started as Chairman of the Adaptation Sub-Committee coming up to five years ago. Early on it was quite difficult to get traction on the question of adaptation because, first of all, the language is a bit confusing. People are not quite sure what is the difference between mitigation and adaptation, so I tend to talk about preparing for climate change and reducing our greenhouse gas emissions as the adaptation and mitigation stories. I think it was quite difficult to explain to people why adaptation was important, and that it wasn't a cop-out and it wasn't saying we give up on mitigation, because we still have to mitigate as hard as we can.

I have to say that when one of your Committee members was Secretary of State for Environment, Food and Rural Affairs, she held a series of green breakfasts—she very kindly invited me to one of those—which I think was important in trying to get representatives of all the Government Departments that have a vested interest in this, which is virtually all of them, to recognise that adaptation is an important cross-cutting Government policy. Whether the momentum that was generated when Caroline Spelman was Secretary of State is being kept up, I am not sure. I have tried to go around and talk to Ministers in different Departments, but with the relatively rapid turnover, you are never quite sure how long the memories last.

Chair: Right, so there are issues there in terms of the traction, both with Departments and their Ministers.

Lord Krebs: I think that is correct.

Q245 Chair: So what would be the recommendation that this Committee should be looking for to try to make sure that that does not happen again and that it is there as a matter of course?

Lord Krebs: It is always difficult when there is a lead Department as other Departments think, "Okay, Defra is in the lead, so they can sort that out and we will get on with our business." I think somehow Defra should be encouraging other Departments to take a significant interest in it and ensuring that other Ministers are engaged.

Q246 Chair: Do you think the NAO has a remit in terms of making sure that this aspect of accountability for Government policy is embedded in how departmental work is done?

Lord Krebs: I don't have a view on that. Do you?

Matthew Bell: The NAO clearly has that cross-cutting perspective across Government and it has the ability to go into every Department to try to understand what they are doing, so the NAO may very well be an appropriate organisation to be able to look across the breadth of policy in that way. Certainly one of the decisions on the mitigation side that the Scottish Government made was to create a Cabinet Sub-Committee specifically to ensure that Ministers are focused on the implications for their Departments of the mitigation activities that need to take place. In the machinery of government, there are other ways of trying to make sure that everybody embeds those messages within their Departments.

Q247 Chair: Just moving on, the current Secretary of State, as I understand it, has made the next NAP voluntary. Should the reporting requirement be made compulsory?

Lord Krebs: It is the adaptation reporting powers that are voluntary.

Chair: Yes.

Lord Krebs: I think what we have seen as a result of that is that some of the infrastructure providers and people who reported in round one have said they are not going to report in round two. I think that is a mistake. Our view is that it should be mandatory.

On the positive side, some sectors—for example ICT infrastructure; well, British Telecom—are voluntarily producing an adaptation report. ICT was excluded from the first round and we said that that was a bad thing. But my general answer is, yes, we should have it as a mandatory requirement. The evidence from the first round is that it did in some organisations help to raise awareness about adaptation at board level for the first time. I think there was a bit of disappointment that there was not a lot of follow-through, so the documents were submitted and it wasn't clear what the consequences were. I also think there is still an open question of whether that initial burst of recognition when the ARP reports were submitted has carried through to continuous action. So the short answer is, yes, it should be mandatory.

Q248 Chair: The Government automatically respond to the Climate Change Committee's report. Would it be helpful to have the equivalent Government response to reports that come from the Adaptation Sub-Committee?

Matthew Bell: In terms of the statutory framework, as we said at the beginning, there is the progress report that the Adaptation Sub-Committee will submit jointly with the Mitigation Committee in June. There is a requirement on the Government to respond to both of those, so the statutory framework requires a response to both of them. What we do not have is a requirement regarding all those intermediate reports that build up to the progress report. There is no requirement in the legislation to respond to each one of those.

Q249 Chair: Would it be helpful to have that or not?

Lord Krebs: I think it would be helpful for the Adaptation Sub-Committee to know what the Government think because we do make certain policy recommendations and there is no formal response. I think it would be helpful to have a formal response.

Q250 Chair: Did you feel you were operating in a vacuum?

Lord Krebs: How can I put this diplomatically? I think it depended on who was the Secretary of State and who were the lead officials in Defra.

Daniel Johns: I think we also have to recognise that we are just entering the first statutory phase of the Adaptation Sub-Committee. This year's report in June will be the first time that there is a statutory report to which there will need to be a Government response. From that point on, there will be a statutory report every other year, so at that point there will be a Government response.

Lord Krebs: Yes.

Q251 Chair: Finally, are there any other things that you think should be looked at in terms of policy changes that would assist you with the important work that your committee is doing?

Lord Krebs: Yes. This may come up later, but I think one area is the role of local authorities. Under the localism agenda, of course, a lot of responsibilities are devolved to the local level: there are lead local authorities on flood risk management, for example. The Environment Agency—as it may have told you—had its last assessment of this in 2013, and five out of 152 lead local authorities had a flood risk management plan, so I think that is a piece of the jigsaw that it is important to complete. There is a missing piece there.

Chair: Right on cue, Martin Caton is going to delve a little bit further into this.

Q252 Martin Caton: The Town and Country Planning Association told us that the UK is critically unprepared for the medium and long-term impacts of climate change because there is no effective mechanism for translating the high-level messages in the NAP into specific practical action through planning systems. Does the planning system need to be changed?

Lord Krebs: The question is: is it the planning policy framework, or is it the implementation of it? I will leave that question on one side, but certainly in current planning decisions we are almost certainly building up trouble for the future. As we pointed out in our various annual reports, we are still building like mad in the flood plain, for example, so 20,000 homes a year, roughly speaking, over the last decade, with 4,000 of those per year in areas of significant flood risk. That is bad news. On the other hand, many of those homes are protected by community-level defences built by the Environment Agency. But there is a question as to whether this build and protect policy is short-sighted, and whether in the end you will have to invest more and more in flood defences to keep those homes protected.

Q253 Martin Caton: While we are talking about that, should planning policy in England be amended to set specific tolerable levels of risk, as is the case in Wales?

Lord Krebs: Yes. I think it is important that the Government communicate to people what level of risk they think is acceptable, and that risk to individual property is likely to increase. The whole insurance regime is going to change in the decades ahead, which will be another difficulty for home owners in flood-risk areas.

Daniel Johns: There are some safeguards. For example, the new flood insurance scheme, the Flood Re subsidised insurance scheme, will not apply to houses built after 2009, and within the funding policy for flood defences, you cannot get national money to help to defend properties that were built in the last couple of years or from that point forward. There are safeguards, but the fact remains, as Lord Krebs says, that 20,000 properties per year were built in flood plains, and while many of them were behind flood defences, those flood defences can be over-topped. We saw in the winter of 2013-14 that properties were protected, but the defences were over-topped, and if you have built more and more homes behind those defences, future damages will of course be higher than they might otherwise be.

But there has to be a trade-off. We recognise that you cannot write off every flood risk area as a development no-go zone. There has to be sensible and appropriate development, but at the moment there are very different data on the types of properties being built in flood risk areas and the types of mitigation measures to avoid those properties adding to long-term risk.

Lord Krebs: Do you mind if I add one more point to this? The Environment Agency is, of course, a statutory consultee on new developments but, as it happens at the moment, it does not comment on small developments of fewer than 10 homes. You may think, "Well, that is not very many," but if you add it all up, that is about 12,000 new homes a year being built without Environment Agency advice on flood risk. So there are things that definitely need fixing in the planning system. As I say, the question of whether that is the planning framework itself, or its implementation at local level, is I think a question that might require further analysis.

Q254 Martin Caton: In practice, is the NAP helping the Government—and, indeed, local planning authorities—to take decisions over planning?

Lord Krebs: You would have to ask them, I think.

Daniel Johns: But it is a great example of how the NAP is not actually driving activity. It is the National Planning Policy Framework that is driving what is happening with flood risk and new development. The National Planning Policy Framework sets out very clear principles that we should only have single developments. That is to avoid inappropriate development in the flood plain, so choices need to be made locally about what is appropriate and what isn't. But, certainly in terms of the headline data that we get, we are seeing more and more homes being built in flood-risk areas.

Lord Krebs: The other point to add to that is that the rate of new build in flood plains is higher than the rate of new build elsewhere, so we are developing flood plain areas at a higher rate than we are the rest of the countryside. It could be for very good reasons—economic benefits, local community benefits and so on—but, nevertheless, we are potentially storing up problems for the future.

Q255 Martin Caton: There are adaptation risks that affect the built environment, transport, and the utility and health sectors. How can these adaptation linkages be integrated into planning policy?

Lord Krebs: You are thinking of links between, say, building provision of infrastructure, provision of green spaces and so on.

Martin Caton: Yes, that's the point.

Lord Krebs: Just to pick up a couple of those, on the green space issue, that is another area where planning policy is not working, in the sense that part of the value of green spaces is to absorb excess surface water and part of it is to reduce the likelihood of an urban heat-island effect if we get to very hot summers in the decades ahead. The amount of urban green space has been declining steadily—a 7% decline since 2001. So, again, with planning decisions, we are losing resilience there. In terms of infrastructure—we might want to come on to infrastructure in more detail—our view is that some areas of infrastructure are thinking long-term about resilience and doing quite well, while others are doing less well. That, perhaps, requires a little bit further dissection.

Another key thing is about water shortage. There are certain parts of this country that are already water stressed—the south-east—and will become more so in the decades ahead if we have hotter summers and more uneven patterns of rainfall. So, again, that is another long-term planning issue: how do you manage both supply and demand of water in relation to future planning decisions and development.

Q256 Martin Caton: Your progress report states that England is the only country not to have a national spatial strategy for infrastructure. How can adaptation policy account for the cumulative impacts across different sectors?

Lord Krebs: Do you want to pick up on that one, Daniel?

Daniel Johns: Within the national policy statements—the most recent was the networks one published earlier this month—the wording of the policy is quite clear in that cumulative impact should be considered in decisions about whether to build infrastructure in particular places, but the question is whether individual decisions and individual planning applications are building up risk in aggregate. We are creating systemic risk by, in most cases, the infrastructure applications being considered in isolation. One of the things we said in our report was that there should be an assessment, looking at it on a place basis, to look at these infrastructure independencies and to assess whether, over time, we are building up systemic risk.

Q257 Martin Caton: The ASC's July 2014 report pointed out that less than half of the planning applications reviewed considered sustainable drainage. Can planning guidance increase the uptake of sustainable drainage?

Daniel Johns: Indeed, and the Government have recently said that they will strengthen the planning system to encourage SuDS and to make it the expectation that in almost all cases sustainable urban drainage systems will be the default option. Lord Krebs wrote to the Secretary of State in September to express concerns that the planning system already promotes SuDS—it already says that they should be made a priority—and we have not seen the level of take up of SuDS that you might expect. It is one of those options—one of those adaptations—that makes sense for all kinds of different reasons. It delivers benefits in terms of water quality and amenity, the urban heat-island effect, and air-water quality, as well as flood risk management. In fact, our own survey found that only 10% of new developments incorporated some feature of SuDS, and even with permeable paving—you can get different types of block paving that allows water to infiltrate into the surface below—that is still used in only about 10% of applications, even though they cost no more to put in and maintain. So they are very much a low-cost option, and it is one of those things that we would like to see happen more and more frequently.

Q258 Martin Caton: This is the last one from me. Lots of development involves changes to existing housing stock. What can we do to ensure that these changes factor in climate change?

Lord Krebs: One aspect of that is building resilience at the property level. We have talked in relation to floods mainly about community-level defences, but there is also perhaps an onus on householders or business property owners who live in flood risk areas to think about property level resilience, and there are measures—we have done some analysis of that—that are not expensive, but would be cost-effective in reducing future flood risk. Flood Re, the new insurance regime, provides an opportunity to incentivise that and structure it correctly so that when people suffer flood damage and they are paid by the insurance company to repair their home, they should repair it in a more resilient way, whether it is raising the electrics off the ground, using more resilient forms of flooring, putting in flood protection guards on air bricks and so on. Given that our housing stock is here for a long time—a lot of the housing stock that is being built now will certainly be around at the end of the century, if not beyond—there is a lot of argument for not only new build but existing build to be made more resilient.

I mentioned flooding, but I think there is also the question of overheating that we want to talk about. Overheating is also an issue because if the climate modellers are correct in their projections, by the middle of the century, the kind of very hot summer that we had in 2003 may become typical—an average summer. So, again, there are questions about what we can do, in addition to new build, to retrofit homes and buildings to ensure that they are resilient in the face of very hot weather.

Q259 Mark Lazarowicz: I am just observing that as we sit having a civilised discussion—as, of course, we would do—we have a cumulative story here of flood plains still being built on extensively, sustainable drainage not being considered in planning applications and only 10% of developments having low-cost adaptations, given what you said about permeable paving stones, as well as the comments about heat and so on. There is a cumulative picture of quite a big failure, bluntly, in public policy governance, isn't there? Is that a fair conclusion? Is that so and what should we be doing about it?

Lord Krebs: I think it is a fair conclusion to say that at the moment we are storing up trouble for the future. We are not doing things in a way that is making the country more resilient. If anything, we are making it less resilient. What should be done about it? I think it is a balance between what central Government think they ought to do and want to do, and what can be done at local level, as well as by individual householders and businesses. I do not think there is a single actor, but maybe central Government need to show more leadership than has perhaps been the case so far. Perhaps the review of the National

Adaptation Programme, when it comes before Parliament, and the consequent response to that, will start to build the recognition this is important.

Given that we only started thinking about it in 2008, when the Climate Change Act was passed, you might say that after going from the starting blocks to where we are now in six and a bit years, we do not expect everything to become hunky dory and there is still a long way to go. I would say, yes, we are not getting it right now, but we still have a chance to get it right, and that is going to need action by all sorts of people and pressure from my committee, as well as others, to ensure that that action is led by Government.

Q260 Mrs Spelman: Lord Krebs, I wonder if you would mind if I just come in on this question. Daniel mentioned, quite rightly, that it is the National Policy Planning Framework that is the overarching strategy structure for trying to help to determine what goes where. There was a significant change to planning reform putting sustainable development at the heart of the planning process. I haven't heard from any of you as witnesses that it is being used as a key consideration about what goes where in relation to the risks posed by climate change. I always understood that we should have less building on flood plains because it is unlikely to be sustainable in the future, with the predictable increasing frequency of extreme weather events. Do you think local government has not understood this?

Lord Krebs: That is precisely why I said there is a question as to whether this is the policy framework or its implementation. I think the policy framework has the right words in it. What we felt, when we looked at this two or three years ago, was that was is not transparent whether local authorities, when making planning decisions, were fully factoring in the impacts of climate change. If it is not transparent, there is a fair guess that they probably are not, but we do not have the data that says, "No, we are ignoring climate change." We just do not have the evidence that they actively are in many cases. Would that be a fair summary?

Daniel Johns: Within the National Policy Planning Framework there are tests. There is a sequential test and the exception test, which allow development in flood plains to take place, and when it gets to that local level, planners will want developments taking place because they do not want to write areas off as being no-go zones. So inevitably there will be compromises in those decisions, balancing all kinds of different factors in favour of development and against development and in those examples, as I say, we are observing that development on flood plains is continuing.

Q261 Mrs Spelman: They are in possession of up-to-date flood risk maps from the Environment Agency, aren't they, with the projected risk over a 100 year period?

Daniel Johns: Absolutely, and developers are required to produce a flood risk assessment. But when we looked we found that in many cases flood risk assessments are not being produced. That is one of the key reasons why the Environment Agency has to object to development in flood-risk areas—because the developer has not done the basic legal requirement. Where a flood risk assessment is produced, it does not always factor in climate change and does not always factor in surface water flood risk. There is a common problem, again, which is why the Environment Agency has to object.

Lord Krebs: There used to be an indicator for local authority performance. I think it is NI188. Is that right?

Daniel Johns: That is right, yes.

Lord Krebs: That was about factoring in the effects of climate change but, as you probably know, NI188 was dropped a few years ago. When it existed that at least provided some measure as to what proportion of local authorities had begun to think about climate change or had actual plans. They were at different stages: we have heard of it; we have heard of it and we are talking about it; we are writing it down; we have a plan. There was a spectrum, and a significant number of local authorities were a reasonable way along that journey, but we do not know now, because the indicator has been abolished.

Q262 Chair: So indicators would have helped?

Lord Krebs: At least it would have helped us to track. The answer to Caroline's question of whether local authorities are taking into account climate change in planning decisions is that NI188 would at least have given us some lens on to that.

Q263 Chair: A report on the Climate Change Committee's work that this Committee did looked at extending reporting powers and so on to local authorities. Presumably you would say that should be an important consideration here in respect of adaptation?

Lord Krebs: Should adaptation reporting powers extend to local authorities?

Chair: Yes.

Daniel Johns: I think it is something we have recommended. The second round is a voluntary approach, but we certainly think that because local authorities are so key to the delivery of the actions within the National Adaptation Programme, some way of them accounting for the action they had taken would be a good thing.

Q264 Chair: You talked about 10% or so of applications coming forward taking account of things like SuDS. Do you think that there is an issue here about skills, training and capacity in terms of the professions—architects, planners, designers—having an understanding of the importance of integrating this agenda into it?

Daniel Johns: I think the issue is of scale. Sustainable drainage systems have been around for decades. People have been building soakaways, ponds, wells—all the different techniques that you can use to mimic natural drainage features. So the issue is turning something that is happening sometimes, but not nearly enough, into the default option. The Government have reinforced the planning system so that SuDS should be the default option, but Sir Michael Pitt recommended one additional step in his 2008 independent report of the previous year's flooding. He said very clearly that one of the barriers to the uptake of SuDS was that developers have an automatic right to connect new homes to existing public services, and that right remains to this day. While that remains, I think there is an argument to say that while developers can always connect to the sewers, they are always likely to want to, so it is an uphill battle to get them to adopt some of these approaches that they could see as much more difficult, tricky, and novel ways of managing sensible drainage.

Q265 Chair: Is there scope for a greater role for building regulations in this aspect?

Lord Krebs: I think building regulations do come into it—in relation to not just resilience against floods but, as I mentioned earlier in response to Martin Caton's questions, resilience in the face of extreme heat. Our homes and commercial buildings, and indeed our hospitals, are not being built in a way that makes them resilient to heat. You could say, "That is fine, we will slap in air conditioning," but that is costly and, of course, works against the mitigation agenda.

Chair: Exactly.

Lord Krebs: So what we really want to be doing is encouraging designers—perhaps through guidance, or it should be perhaps even mandatory—to think about what the climate is going to be like in 50 years when these buildings will still be around and people will be living, working and being ill in them.

Q266 Caroline Lucas: When you say "perhaps even mandatory"—I certainly agree with what my colleague was just saying—although you are speaking very quietly and gently, the picture you are painting is quite worrying.

Lord Krebs: Yes.

Caroline Lucas: What would it take, for example, for your committee to be saying, "This should be mandatory"? You are talking about something as simple as the paving stones that allow drainage. It seems crazy, frankly, that if you are in a flood risk area, that would not be what you use. Why could we not do that?

Lord Krebs: I do not think there is any reason why we shouldn't.

Q267 Caroline Lucas: Okay. My real question goes back to the issue of infrastructure. We touched on it earlier and you were suggesting we might have longer to unpack it. The national policy statements require consideration of the impacts of climate change when planning location, design, build and operation of new infrastructure, and I wonder if you could say a little bit more about how well the statements are operating and ensuring resilience across different networks.

Lord Krebs: Yes. When we looked at this last year in our annual report, we identified a range of levels of sophistication in this. For example, I think electricity infrastructure providers have clear plans of action and are monitoring that, so they got a gold teddy bear for their behaviour. There were others in transport, for example, that were less well developed. So I think the answer here in broad terms is that the best are doing well and have long-term plans, while the worst need to do some catching up, but there has been a recent Department for Transport publication—

Daniel Johns: The national network policy statement.

Lord Krebs: Yes.

Daniel Johns: When we looked at individual new nationally significant infrastructure projects—the NSIPs, or whatever you call them—what we found was quite comforting in that they obviously had taken account of climate change, as their policy statements require them to. For example, High Speed 2 as a project is obviously very aware of cutting through flood risk areas and has plans to deal with that. It is also quite interesting that when they were building the tunnels or specifying the size of the tunnels, they allowed some space within tiles to fit additional cooling in future decades, should they need to. In some cases, they have built in additional resilience from the outset because that is the cheapest thing to do. In other cases they have built in additional flexibility so that they can adapt the infrastructure they are building in the coming years to be resilient to climate change in the future.

So certainly, when you look at individual applications, it does feel like appropriate account is being taken, certainly of the primary risks around flood risk and overheating—heat stress. Perhaps some of the lesser risks or the ones that are not factored in quite so strongly are around surface water and water stress as well.

Q268 Caroline Lucas: The example you gave of HS2 was a good one in terms of my next question was about whether or not the NPS are operating on the right time scales. HS2 sounds like they are looking at least 30 or 40 years ahead. Is that something that you would say is fairly consistent across different sectors, or does HS2 stand out as one that has perhaps been forced to look ahead a bit more?

Daniel Johns: There have been very few nationally significant infrastructure projects. Most of them are to do with transport and energy. What we did not have the resources to do was look at the lower tier of infrastructure projects—the ones that are not big enough, and not expensive or risky enough, to make it into the nationally significant bracket. So perhaps one task we might come to in time is to look at that lower tier of infrastructure projects to see if the same thing is happening.

Lord Krebs: Another aspect perhaps of long-term planning is the providers of water—the water companies—and they do have long-term plans.

Some—Thames Water, for example—recognise the supply-demand gap opening up in their area as the result of the combination of population growth and increased demand for economic activity, but also potentially from decreased rainfall as a result of climate change. They have plans that stretch out into the future as to how to manage that supply-demand gap. That is good news, but their plans tend to be on the 20 to 30 year time scale, rather than the 50 years-plus time scale, so there are still questions about how long your time horizon should be. But I think it is fair to say that the water companies in general do have plans that run into several decades ahead.

We think that the supply-demand gap should be managed by not just trying to provide more water, but managing how much people use. That leads us into the whole question of metering, which again we had clear recommendations on.

Q269 Caroline Lucas: Could you add a bit more about the cross-sector network resilience review that is due in 2015 by the UK Regulators Network? Can you say a bit more about what you think the review should address and how it will take account of key links between critical networks?

Daniel Johns: It is not a review that we have looked at, I am afraid.

Q270 Caroline Lucas: We have talked a little bit about cumulative impacts, but is there any more you could say about how in planning for adaptation you factor in the cumulative and indirect impacts, economic or otherwise, of network failures? I know you have said a bit about cumulative impacts already, but looking at network failures and how those have a knock-on impact, is there more you could say about how much you have looked at that?

Lord Krebs: There are clearly key interdependencies. We have said that that question of interdependencies needs to be factored in, in preparation for plans for improved resilience, but I don't know that we have anything more specific to say at this stage.

Daniel Johns: No. We obviously have to rely on the work that is going on elsewhere within academic institutions. The Infrastructure Transitions Research Consortium's Professor Jim Hall was in front of you during your last session. We rely obviously on such pieces of work that are looking at the systemic risks and looking for hotspots, and looking to see those risks being managed.

Q271 Caroline Lucas: My final question brings us back to regulators and Government. Again, we have touched on this, but is there anything else around what regulators or the Government should be doing to incentivise building resilience into older and aging networks and infrastructure? We have talked a bit about regulation in terms of—

Daniel Johns: I think infrastructure in general is an area where we do see quite a lot of positive action being taken. The electricity transmission and distribution sector, in particular, we have highlighted as one that we see as taking the right kind of approach. We have also obviously seen since last winter—the winter of 2013-14—a greater emphasis within the transport sector looking at roads and rail.

Within the water sector itself, when we worked on our report, we primarily looked at the physical protection of individual assets, but we also recognised that a lot of work is going on within this next price review period, for example to connect parts of the country to more than one source of water. For example, I did not realise this, but Birmingham has only one source of water and if that source gets cut off, you have a major city without water for a long time. As part of the price review process, however, there are additional sources being built and that is a great way of safeguarding resilience. You do not need to protect every single asset to the point where we would never fail; you just need to make sure that the customers are able to be given the services they require.

Lord Krebs: Let me pick up your question about whether there is a need for more regulation? One area that I touched on a few minutes ago, which we highlight in one of our reports, is water metering. There has been reluctance on the part of Government to make water metering mandatory. We know from consumption figures that metered households have had declining consumption over the past few years whereas non-metered households have not. We also know that the typical person in this country uses more water than the typical citizen of Germany, yet they are not noticeably dirtier than us. So there are ways of making our water use more economical and more effective, and partly that is putting a price on it that reflects the amount of water you use. One response is to say, "Not all parts of the country are equally short of water. The south-east is generally short, but the north-west is not." But when you start factoring in climate change and look at where the shortage is likely to arise in 20 to 30 years' time, some of those areas are not metered to a high degree at all at the moment. We do think there is a case for looking at whether there should be more mandatory metering to manage demand so that we get it down to levels comparable with other northern European countries.

Q272 Dr Whitehead: When Defra announced its short-term plans for flood risk management the Environment Agency published an overview of long-term investment scenarios. There was some comeback on the question of the targets for those short-term plans in addition to the question of whether the flood defences would be sufficient. What is your view about the extent to which that sort of short-term, and indeed longer-term, targeting does in fact prioritise the right areas? For example, there are the areas of holding the line, no action, managed retreat and so on? Is it your view that that sort of analysis is appropriate, or that it merely reflects the lack of funding that might be available for flood adaptation in the future?

Lord Krebs: I am going to ask Daniel to comment on this because he is an expert in flood defence, but I think what we took as the headline from the December announcement by the Government of the long-term investment scenarios is that it is good: there is investment, and there will be more houses that are better protected; 300,000 households might be better protected by 2021. But underlying that, or behind it, is the fact that flood risk is going to increase, so we are not investing enough to maintain flood risk at the present levels. That is a question that arose earlier in the discussion of what is an acceptable level of risk. We need to have transparency that in the face of a changing climate, we are investing as a nation quite a lot of money in flood defences, but not enough to protect homes at the same or equivalent level of risk that they are protected at today. That is my headline point.

The other headline point to make is that the long-term investment scenarios do require a lot of contribution from external funders. I think £600 million of external funding contribution is part of the investment scenario, and it is not totally clear where that £600 million is going to come from. So, even the plan itself has question marks over it that it will not deliver a level of risk that is comparable with today's risk.

Daniel Johns: We have to recognise that the long-term investment scenario is exactly what we would like other sectors to be doing: looking that far ahead, looking at a range of different climate scenarios, and then making sensible investment choices in the context of that evidence. It does show that over time, at least by 2021, we might even see a net reduction in flood damages by about 5%, but underlying that is the number of homes at high risk of the one in 30 or greater annual chance of flooding. The number of homes at high risk will increase over the course of the coming decades, and I guess it is fair to say that that is also the best case scenario, because it assumes that development does not add to the number of homes at flood risk. It assumes also that there is enough money to invest in every single worthwhile scheme. At the moment, most schemes have to achieve a benefit-to-cost ratio of about 5:1, so the benefits have to exceed the cost by a factor of about five. The long-term investment scenarios assume that even if every scheme delivers benefits only just above costs at a much lower bar than the value-for-money one that the projects have to meet, and if every single worthwhile scheme is delivered in the coming decade, there will still be more homes at flood risk than there are today.

There are two immediate implications around development: first, making sure that development helps address the problem and does not add to it—at the moment we have concerns that it is still adding to it—and, secondly, what you do with these homes for which a future of increasing and unmanaged flood risk at the community level is implied. There is property level protection and there is insurance, and there are lots of different ways of managing that residual risk, but the Government do not have a strategy for addressing those homes that will still probably be at high risk in the 2060s.

Q273 Dr Whitehead: One of the reports—or should I say pieces of unpublished analysis—that I have in mind is the analysis the Environment Agency did on the likely number of properties that would effectively be, as the press puts it, "sacrificed to the sea" over the next century, even if the long-term plans are carried out, presumably on the basis of that sort of analysis of additional risk over and above what it is reasonable to depend on. Has the Committee on Climate Change had access to that unpublished analysis?

Daniel Johns: Certainly not an analysis that shows where those homes might be. The long-term investment scenario is a national assessment. The Environment Agency will have models that show which parts of the country are more likely than others to become vulnerable to flood risk, but it is also fair to say that the model was built as a national assessment, and it is probably not appropriate to try to break it down to say which communities are at risk and which ones are not. I would say that there need to be conversations held in certain parts of the country where you would probably expect flood risk to increase and where it will never be cost-effective to protect. Those conversations can revolve around property-level protection, community resilience, and signing up for flood warnings—there are things that can be done—but because those conversations are not necessarily happening at the moment, you just get a crisis whenever a flood event occurs, and then a reaction when money has to be spent very quickly, and not at particularly good value for money, to try to put things back where they were, when in fact in the long term these events may well just happen more frequently.

Lord Krebs: Were you asking specifically about coastal flooding?

Dr Whitehead: Yes.

Lord Krebs: We looked at that in our 2013 annual report and concluded that there are two ways of dealing with coastal flooding. One is to build hard defences and the other is to retreat—managed realignment, it is generally called—and the Environment Agency believes that managed realignment is the best policy for about 10% of England's shoreline by 2030. But the current rate of managed realignment is too slow by a factor of five, so the rate has to increase. Much of that managed realignment will not involve loss of property. It may be loss of agricultural land, which is another issue for the farming community, but we thought in 2013 that although there is a framework in place for implementing it, it is not being implemented at the right pace.

The problem with hard defences is that they often work only if there is also some soft defence on the seaward side—if you have a sea wall and then a bit of salt marsh or a shingle bank or something—because otherwise the hard defence could be over-topped, or indeed broken down, by extreme wave action. That is the problem if you just rely on hard defences and the sea level rises, because the land between the hard defences and the sea will get squeezed out, and the defences will not be sustainable unless you build them up. We think that soft defences and managed realignment is an important part of the national strategy, as does the Environment Agency, but not enough is being done to implement it.

Q274 Dr Whitehead: The problem I have, however, is the issue of whether the figure, or suggested figure, of 7,000 properties that appears to arise from the Environment Agency's analysis—

Daniel Johns: Yes, that is one we have not seen.

Dr Whitehead: Nor have we. It is whether that is something that arises from an assessment of eventual underinvestment, or of the rate of investment being too slow to deal with those issues, or if it is simply a sensible and ultimate view of what is defensible and what is not defensible. Clearly, if 7,000 properties are to be involved in one or other of those views, that is a rather serious potential divergence of cause. Is that something you would be concerned about?

Lord Krebs: We would certainly want to look at the Environment Agency's analyses. As I say, we did look at coastal habitats and flood risk in 2013, and we will in due course come back to that, so we will talk to the Environment Agency and see what the basis of its analysis is. It may also depend on what assumptions it has made about sea level rise and the occurrence of extreme events. We assume that sea level rise was expected to be up by between half a metre and a metre by the end of this century, so that is very significant for low-lying parts of the country, but I do not know what the Environment Agency has assumed. I am sorry; I am floundering a bit because I have not seen the report.

Q275 Dr Whitehead: We are in a mutual floundering situation. I am not sure we can take that any further, but it would be good to get that analysis more generally available.

Your progress report seems to suggest that what we are talking about in terms of cost-effective outcomes and what gets you where you want to go shows that the recent extra funding at the Somerset Levels subsequent to the flooding might have been at the expense of using that funding elsewhere for more cost-effective outcomes. Would that be a fair assessment of what you appear to suggest in your report, or was that unintentional?

Lord Krebs: Daniel wrote that report.

Daniel Johns: Again we have to recognise that funding is scarce, constrained and limited, and if money gets spent on something, it cannot be spent on other projects. If you are spending money in the Somerset Levels, for example, where it achieves about £1.90 per £1 of investment, which is the investment benefit from dredging the Tone and the Parrett, we are not spending that money at perhaps 5:1, 8:1 or 12:1 in preventing flooding in other parts of the country. The question is whether you should have a flood-risk management strategy that is reactive and try to build defences where it flooded last, or if you should try to build defences where it is most likely to flood next and can deliver the most benefit.

Obviously, the strategy should be the latter, and we recognise that given severe events—the Somerset Levels have obviously experienced widespread flooding for a period of time and lots of damage was caused—at the same time when there is limited funding, you have to be aware of those kinds of trade-offs. If you are spending money in some parts of the country, you are not spending that money elsewhere.

Q276 Dr Whitehead: Is that effectively an analysis of what we know about short-term funding as opposed to what might be seen as this longer-term process of deciding what is ultimately defensible and indefensible? Is it that even if you threw a large amount of money at certain things at certain stages, it might not make an enormous difference to the ultimate outcome?

> ***Lord Krebs***: It is true that some of the Somerset Levels spend was just a one-off—a burst to try to fix things that had gone wrong—and perhaps that was what needed to be done. However, the longer-term decisions, as Daniel said, should be focusing on where we get the biggest bang for our buck.

Q277 Dr Whitehead: Certainly that bang per buck, to some extent, is being outsourced to local authorities, one might say, to add to the responsibilities being placed in their court. Do you think that they have the funds, skills and capacity to manage flood risk long term, particularly in the context of, let us say, a local authority discovering, perhaps even as a result of the Environment Agency's workings coming to light, that a large number of properties in its area are effectively going to be—or so it would read into this—abandoned long term? There would presumably be enormous pressure for that local authority to commit large amounts of funding to stop that happening regardless of any other relative priority elsewhere.

> ***Lord Krebs***: I would have thought that in the foreseeable future much of the investment will depend on Environment Agency resources. The local authorities may, as indeed happens sometimes, be putting in matching funding, but still the Environment Agency will, I imagine, in almost all cases have an important part to play. It would be rare, if ever, that a local authority would simply go on its own because of local pressure, partly because, as you implied, the resources required are too big. My own local authority is Oxford City Council and there has been a lot of talk for many years of a western flood relief scheme to take water out of the Thames and take it past the flooding in parts of Oxford, and then put it back in the Thames lower down. The city council itself could not fund that, so it relies on external funding, and now it appears that external funding, as a result of the Autumn Statement, will be made available. I would imagine that that would be the situation for the hypothetical local authority to which you refer. Is that right?

> ***Daniel Johns***: That is right, and there are a lot of positives to come out of last winter's flooding in the Somerset Levels: the action plan and things to address water over-topping the banks. However, one of the main things to come out of it is a much greater sense of shared responsibility for flood risk in the area. It is not a national problem that the national Government need to spend taxpayers' money to sort out; the landowners in the area have responsibility for the crops that they grow, the planning authority has responsibility in terms of where it allows development to go ahead, and there has to be a shared responsibility for managing those areas of watercourses based on shared funding and people paying for the benefits they receive from being able to live, work and operate in that particular area. I think there has to be a shared responsibility like that, because it would be unfair to expect the taxpayer to fund things when it might just exacerbate the problem, which is in some cases is due to inappropriate farming practices and uncontrolled development on the flood plain. So there has to be some sense of responsibility there for people to share the problem.

Q278 Mrs Spelman: I am going to try to compress my questions a bit because we are beginning to run out of time. They are all around public awareness of climate change, which your own report warns is low, and they are all directed at what we do about that.

You mentioned Flood Re. Do you think, for example, that greater awareness of flood risk will be achieved through those proposals? Do you think there is more that we could be doing to bridge the gap between adaptation research and practical action? For example, what else do we need to do to communicate that to the public, and what about the awareness of persuading people to pay for adaptation, rather than mitigation, because the benefit will come to them locally? What do we need to do to capture the public imagination?

Lord Krebs: We certainly need to do something. One survey shows that around half of householders living in flood risk areas are not aware that they are living in flood risk areas,

I did ask the Government how much is spent on, and who is in charge of trying to raise public awareness of, the impacts and risks arising from climate change. There is a programme run by the Environment Agency, funded to the tune of £1.6 million a year, called the Climate Ready Support Service, but that is really aimed at businesses. In terms of the wider public, as far as I can gather, there is no Government initiative to raise awareness.

Q279 Mrs Spelman: Should there be one?

Lord Krebs: Somebody should have that role, so if it is not central Government, I think they should say it is the Adaption Sub-Committee's role or the Environment Agency's role. You are right in a sense: the motivator of this has to be partly that people see it as important. It is local, so it has more salience than mitigation, which is somehow out there with people thinking, "China is pumping out stuff, so why should we bother?" This is about, "My life in my local community, my home and my local recreation ground," or whatever. So there is an opportunity to motivate people and inform them.

It is always difficult when the thing is very long term, so if you are trying to say, "Well, this is a risk that may or may not happen in the next few decades and we cannot tell you exactly how big it is," that is not a clear message. If you said, "Here are things that you need to do anyway. Whatever the future holds, these are sensible things to do," that is a message that we could somehow get out, but it is not getting out effectively at the moment.

Q280 Mrs Spelman: Flooding is quite tangible.

Lord Krebs: It is one of the most tangible.

Mrs Spelman: It is the most powerful one. Do you think the Flood Re proposal should be extended to small businesses?

Lord Krebs: This was much debated when the Bill went through Parliament—through the Lords, anyway—and there was a lot of argument on both sides. It does seem to me our evidence suggests that small businesses are not making really adequate preparations for the impacts of flooding on their businesses. The arguments for and against them being insured through Flood Re, or whether in fact we should motivate that, were many and varied, but I think one way or another we need to get small businesses signed up to this.

Q281 Mrs Spelman: Just in terms of big business—I am sorry, but this is lobbing in one more question—do you think the threat of stranded assets, or in fact assets lost altogether, through climate change risk, and particularly flooding, is something that might create a bit of a tipping point in perhaps a sceptical business community?

Lord Krebs: To talk about them as stranded assets, yes, it might well do. I do not have any competent authority to judge that, but I think that we need to be creative about the messages we put across and perhaps thinking in terms of stranded assets, buildings or other assets that you will not be able to use in 50 years' time will begin to get the message across to investors. That could be a motivator.

Chair: It might just be helpful to remind you that we have 10 minutes left. Lord Krebs has to leave at 4 pm.

Q282 Neil Carmichael: I will be quick, because you have been touching on my subjects already.

The question I suppose is this: should we build in resilience or rely on emergencies; or what is the balance between the two? That is at the heart of this debate right now, so, Lord Krebs, what do you think?

Lord Krebs: I think it is not an either/or. We should be building in resilience, but part of building in resilience is having an effective emergency planning system. Again, we did look at that in our 2014 report and we concluded that overall the emergency planning system is pretty good. If you take the December 2013 floods on the east coast, because of early warning and effective action, 18,000 people were evacuated, but nobody died. If you compare that with the 1953 similar level of tidal surge, 305 people died. We have become better at emergency response.

Our question is that with cuts in fire service, police and other providers of emergency response, will the system will be up to the job in five, 10, 15 or 20 years' time? I do not see it as an either/or. We have to build resilience in all the ways we have talked about, and because there will always be emergencies that exceed whatever resilience level we have, we have to have an effective system to respond. That would be my simple answer.

Q283 Neil Carmichael: I think it was Martin, or perhaps Alan, who was talking about this as well, but a question then arises in various levels of emergency planning, local authorities, government and everybody else in terms of agencies. Are they really fit for purpose for the situation you are outlining?

Lord Krebs: Yes, and is there sufficient co-ordination across them? Daniel, do you want to come in on that one?

Daniel Johns: I think certainly within this country we have a very strong legal framework for emergency planning, which is the Civil Contingencies Act, and certainly we have had quite a few emergencies to test those arrangements, as well as the ones that have been done specifically around flooding, such as Exercise Watermark, and also the lessons-learned report from Sir Michael Pitt in 2008.

When we looked again last year, there were concerns about the level of capability to manage certain types of emergency, so while the Cabinet Office runs a national capability survey every other year, primarily it talks about processes: do you have a plan for this; do you know what to do in the event of that? It does not ask questions such as, "What assets and what capability do you have to respond to certain types of emergency?" Also, when you talk to local resilience forums—the local authority, police, fire service and a nexus of emergency planners and responders—they still feel that they do not have sufficient information, for example, about critical national infrastructure assets within the area to be able to plan effectively.

Despite progress, and despite there being a quite clear emergency planning framework in place within this country, there are still some shortcomings around resources, information and certain aspects of capability.

Q284 Neil Carmichael: Communication essentially, because that would be the thing that would bring those things together, would it not?

Lord Krebs: It is communication and capacity. It is expertise, skill and people.

Q285 Neil Carmichael: Your report seems to be thinking about weather conditions now and wondering about these issues in that context. Of course in 50 years' time the predictions are that things will have sharply changed. Do we need to be thinking more about what might be the case in 50 years' time to build in the structures, strategies and processes?

Lord Krebs: We definitely do. We have always taken as our starting point to look at the current risks how we are dealing with those, and then asked how those risks will change in the future and what changes we need to make to our preparation. As Caroline Spelman said, current risks are the kind of contact point for everyday people, so we could say, "Well, you got flooded last year, and that is the kind of thing that might become more common in future, so let's think about how we are going to deal with it." Yes, I agree with that.

Q286 Neil Carmichael: Thank you. One last question: there is a parallel between responding to terrorism and so forth and these sorts of disasters in terms of the same sort of emergency services being used. Is there anything we can learn from what the other does, or could there be some joined-up thinking?

Lord Krebs: That is an interesting question that I have never thought about.

Chair: You have the opportunity now.

Lord Krebs: Yes. Do you want to say anything? I do not know if I want to say anything.

Daniel Johns: Only that the two are treated fairly similarly in that the National Risk Assessment looks at both civil and more literally terrorism-type emergencies, and a lot of the climate-related risks are within the National Risk Assessment, as they should be. So a major coastal surge or a heat wave are all in there, and that again provides a very effective framework for local planning to take place.

Q287 Neil Carmichael: It boils down to being aware, or at least having some idea of the likely problems that might emerge so you can respond to them. A fascinating incident between von Rundstedt and Rommel when they tried to defend the Atlantic Wall was that they either had to defend the whole thing or have a strike force, but they chose neither and communicated badly, so the disaster was for them and not us, thankfully. There is a parallel and there are some lessons there, are there not?

Chair: I think the lesson is that we have to move on very quickly because I can see that Lord Krebs is about to depart.

Lord Krebs: Saved by the bell.

Q288 Mark Lazarowicz: One question that probably brings the session to a close is that the Adaptation Sub-Committee is due to report on the implementation of the National Adaptation Programme by July 2015. What do you consider to be the key risks and adaptation challenges over the next five to 10 years, and also for the longer period—say 40 to 50 years?

Lord Krebs: I think the key adaptation challenges that arise from the climate change risk assessment that was published in 2012 are that the top ones both relate to water. It is flooding from extreme events, sea level rise or increased rainfall, and it is water shortage from extended periods of hot weather and perhaps longer periods of drought. Those are the two top areas for this country. It will vary, as we said earlier on, between parts of the country, too. Just in a sentence or two those would be my top-level risks. There are others, but if we are trying to keep it tight, that is what I would say. Would you agree?

Daniel Johns: Absolutely. The third area that probably does not get quite as much prominence, because they are not natural environment emergencies, is the natural environment. Certainly over the course of decades we have seen the natural environment fragmented and degraded, and we do not see sufficient action taking place, for example for the Government to meet its own 2020 biodiversity targets. If you want to have a natural environment that is resilient and able to adapt to climate change, you need to get it into a pretty good state to start off with and that is certainly not the case. For example, there are quite major policy gaps around the condition of upland peat, which is important for adaptation, flood risk, water quality and water scarcity, but also for mitigation, because if peat lands continue to dry out and degrade, that is 500 million tonnes of carbon dioxide just from the UK upland peat that could enter the atmosphere.

Q289 Chair: Can I just ask if you feel that the EU should have a role in this? Should adaptation just be addressed at the national level or at the EU level?

Lord Krebs: Different countries in the European Union are at different stages in preparing national adaptation programmes. Where there have been reviews by the European Environment Agency and by the German Government looking at how different countries are doing, in spite of all that has been said that it is critical, the UK comes out pretty well. We have a piece of legislation, we have an independent statutory committee on adaptation and we are working through the policy implications. I think it probably will be more for member states because the adaptation agenda will be different in different member states with different priorities, rather than it being for the European Union to set a very tight framework. If you go to the Commission's website, there is a statement about adaptation, but it is not prescribing what should go on in a particular country, and that is probably right.

Q290 Chair: I started off by saying that 2015 was an important year. It is also an important year because of the Paris conference. I realise that we are almost out of time, but just in a sentence, how important is the outcome of the Paris conference in terms of finding targets on climate change agreements in respect of adaptation?

Lord Krebs: Matthew, do you want to speak to that?

Matthew Bell: Indeed. Certainly what is clear from some of the science that is preceding the Paris conference in terms of the Intergovernmental Panel on Climate Change is that adaptation is one part of what can be done, but adaptation alone cannot respond to the risks of climate change. In that respect, what comes out of Paris is important. On the mitigation side, we have a statutory duty to take into account the international developments in thinking about what is appropriate for the UK, and we will be presenting to Parliament our recommendations on the fifth carbon budget in December pretty much simultaneously.

Q291 Chair: Should there be binding commitments on adaptation?

Matthew Bell: Adaptation is a much more local phenomenon than mitigation. Carbon dioxide is a global issue. Everybody gets affected by carbon dioxide emissions and other greenhouse gas emissions, wherever they occur. Adaptation is a much more national and even sub-national or regional issue, whereas the appropriate measures are much more national. Whether you need an international agreement specifically on adaptation, as opposed to one on mitigation that might limit how much you need to spend on adaptation, is more debatable.

Lord Krebs: The other point I would make is that the metrics for what constitutes good adaptation, as we have discussed this afternoon, are more difficult to identify. With mitigation you can say, "We aim to reduce our greenhouse gas emissions by x% over the following period and we know we have to manage climate change to somewhere around 2º," which is what most of the scientists think is not going to be so devastating as larger changes, and we know what the target for greenhouse gas emissions has to be. There is no comparable statement to make about adaptation because it is situation-specific. Therefore, to have an international agreement to say that we will achieve certain adaptation targets means it would be difficult to identify what those targets are. They would vary from place to place.

Chair: We are two minutes over, so I am conscious that I do need to wind up the session. May I thank each of you for coming along this afternoon? We look forward to hearing further from you in respect of the invaluable work that you are doing. Thank you very much indeed.