



House of Commons
Energy and Climate Change
Committee

**Severn Estuary Tidal
Power Projects**

Oral Evidence

14 October 2009

Lord Hunt of Kings Heath, OBE, a Member of the House of Lords, Minister of State, Department of Energy and Climate Change, and Ms Sarah Rhodes, Acting Director, Office for Renewable Energy Deployment

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Oral evidence

Taken before the Energy and Climate Change Committee on Wednesday 14 October 2009

Members present

Mr David Anderson
Colin Challen
Charles Hendry
Anne Main
Judy Mallaber
John Robertson

Sir Robert Smith
Paddy Tipping
Dr Desmond Turner
Mr Mike Weir
Dr Alan Whitehead

In the absence of the Chair, Paddy Tipping was called to the Chair

Witnesses: **Lord Hunt of Kings Heath, OBE**, a Member of the House of Lords, Minister of State, Department of Energy and Climate Change, and **Ms Sarah Rhodes**, Acting Director, Office for Renewable Energy Deployment, gave evidence.

Q1 Chairman: Lord Hunt, welcome again to the Committee. When you last joined us you were still a novice; I think you had been in post for about 24 or 48 hours.

Lord Hunt of Kings Heath: It now feels like 24 years, Mr Chairman!

Q2 Chairman: We are expecting some output from the Department, and it is coming, so it is good that you have come, and we are delighted that Sarah Rhodes, the Acting Director of the Office for Renewable Energy Deployment, has been able to join us. I think this will be a fairly informal session. It is a one-off session. We are just keen at this stage to talk with you about the Severn Barrage, the prospects and the way forward really. It would perhaps be helpful if you could just give us an update of where you think the project is.

Lord Hunt of Kings Heath: Thank you very much, Mr Chairman. Thank you for this opportunity to give evidence on Severn Tidal Power. I think we are at a very interesting stage of the process. Clearly, the potential to produce five per cent of our electricity needs is very considerable indeed. On the other hand, there are many issues to take into account, not least the technological challenge; the issue of cost, which in the case of a number of the schemes is very high indeed; the issue of environmental impact; the issue of impact on jobs—on the one hand, any of these schemes will produce additional jobs but there may be a consequence for other parts of the Severn, including fisheries and ports. The eventual decision, I believe, is going to be a challenging one. In a sense, it goes to the heart of what we mean by sustainability, because there is clearly a tension between all of these desirable aims. We started the process at the beginning of 2008 by establishing a long list of schemes that could be considered. A process of analysis was gone through, looking at all the issues in relation to technology, cost, getting an initial view of some of the environmental impacts, and then a draft short list was produced at the beginning of this year for consultation. We received a lot of feedback but I think within the consultation

itself no hard evidence came back that would suggest that the original short-list was wrong, so in the summer we confirmed the short-list. We are now going on to do much more intensive work, looking both at, as I say, environmental impacts, some of the engineering issues that need to be tackled, studies of the socio-economic impacts, also looking at issues around the funding and the relationship between the public and private sectors in terms of how a scheme should be taken forward. The aim would be to bring all that together at some stage in 2010. Government then needs to come to a view. I guess there might be two or three options there. One, at that stage we could signal that we would wish to support a scheme or a combination of schemes. We might say that at this time we do not think it is viable to go forward but one might need to come back to that if, for instance, in future years it was felt in relation to our renewable energy targets that we needed to give a boost to efforts to reach the targets we had set, or I suppose a conclusion might be that it was not thought to be viable at the present time, nor in the medium future, but of course, it would be open to a government in the future to come back to it. I cannot tell you, Mr Chairman, exactly in 2010 when the work will be finished but the intention would be to come to a view and then go out to public consultation again. If it was decided we were going forward with a scheme or schemes, a lot of work would then need to be done in relation to environment issues, funding issues and also consent and planning issues. So it would be some time before you would be in a position, if a green light were given, to actually see construction taking place.

Q3 Chairman: So, after all this work, the big decision is not going to be until 2010 about whether it is no go or go or whether it is put into the future, saying it is a possibility for a later date?

Lord Hunt of Kings Heath: Yes, that puts it very succinctly. This is a very challenging issue: there is great potential, a lot of issues to be considered, and I think we have to have as much information as possible before we come to make a final decision.

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Q4 Chairman: Let me be a bit pushy and say to you: do you have a feeling yourself at the moment about how it might go? What is your inclination on this?

Lord Hunt of Kings Heath: My inclination is, if you will allow, that we need to do this hard-headed analysis before a final decision can be made. Of course, the Committee on Climate Change has some interesting points to make in its very recently published report, which essentially says that at the moment any of the schemes that are on offer within the Severn tidal area look expensive. Nonetheless, at some stage government might need to come back, looking again in the light of progress in relation to renewable energy in general. I am not saying, Mr Chairman, that I would endorse the Committee on Climate Change's views but I think it shows some of the issues that we need to consider. I am reluctant to go any further than that at this stage.

Q5 Chairman: I said I was a bit pushy. Just on the short list, were Ministers involved in a decision on the short list?

Lord Hunt of Kings Heath: Yes, they were. My predecessors were involved in the decision at the beginning of the year in terms of the consultation. I took the decision in the summer.

Q6 Chairman: A great deal of work has been done but one of the potential showstoppers is the effect on the environment. Up to this point no real environmental work has been done. Is that a sensible way to go forward?

Lord Hunt of Kings Heath: First of all, we are clearly aware of some of the environment impacts, whether it is on birds or whether it is on migrating fish. There will be other environmental issues that need to be considered as well. Given the legislative constraints under which we operate—there is the Habitats Directive, the Birds Directive; I think that all together there are 65 pieces of legislation that might impact, not all of them environment but many of them—clearly a lot of work needs to be done. The point about the short-listing process is that, because our responsibility under the Habitats Directive and other legislation is to consider projects that are considered to be reasonable or feasible, it seems sensible to start with a test of feasibility, and that essentially is what the short-listing process has done. Having done that, we then go into much more detailed work. Clearly, the environmental impact presents very great challenges indeed. It poses the question of whether one can avoid environmentally damaging impact or whether it can be mitigated; if not, whether compensatory measures can be taken. Given the scale of the various projects in the Severn tidal area, if it is not possible to develop compensatory measures, can we develop this concept of equal value so that if you cannot compensate, there are improvements you can make to the environment in another area which can be seen as compensation? These are difficult issues which we will have to fully explore. We were keen to get it down to a short list and then to do the work. I perhaps also ought to mention that, of course, because we do not want to exclude schemes

unnecessarily, for the schemes not short-listed we nonetheless have a feedback process so that in the course of our work, if we come up against evidence that suggests that one of the schemes that has not made it to the short-list might meet the criteria in the future, we can bring it back into the system. Of course, we are also funding some embryonic technologies as well where there have been proposals put forward where it is suggested that they may have less environmental damage and we are putting some money in to see if it would indicate that it would then be worth doing much more extensive work. If, for instance, next year it appears that the work on embryonic technology—one of the decisions might be to say, "This looks promising. We will not make a decision on a scheme at the moment. We actually think it might be better to come back in a few years' time, when there may be able to be more development work on one of the embryonic technologies and then you can judge them against the criteria." We are trying to be as flexible as possible. In view of the scale and potential of the proposals, it has to be very rigorous. We know that, because of the environmental impact, there will have to be a very robust process indeed to go through. It seems sensible to do as much work as we can now around the short-listed schemes and then come to a decision next year.

Chairman: That is really very helpful. You have already mentioned the scale of the project and the scale of the costs, and I know colleagues want to talk to you at some length about that.

Q7 Colin Challen: You have mentioned the probability that this would be quite an expensive scheme, whatever shape it takes. One of the ways that the expense of electricity generation is presented is in its cost per kilowatt hour. I am just wondering what elements the Government takes into account when it itself draws up such comparisons. Is it simply based on the capital cost of construction plus the running costs, or does it also include things like the shadow price of carbon? In the case of a Severn barrage, would it include, where relevant, the possibility of flood prevention? There are other costs which on the surface may not have a great deal to do with power generation but which nevertheless would be a clear and demonstrable benefit to the public.

Lord Hunt of Kings Heath: Thank you. I will ask Sarah Rhodes to comment in detail but, as a general principle, clearly, what we are trying to do, we have this concept of a levelised energy cost, so it is possible to make direct comparisons between different types of energy technology. This has been one of the factors in deciding which schemes ought to go forward in the short list, and we have been working to a figure of £170 per megawatt hour as being the top level, which is comparable to some of the most expensive renewable energy technologies that we would see forming part of our renewable energy targets by 2020. We have also given ourselves headroom, going up to £200 per megawatt hour, in order to see if there are some schemes which would come in at the higher cost but would have less damaging environmental impact. So, in general,

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levelised costs include the cost of financing capital, and so you can get a level playing field. In terms of capital, the issue here, I think, is that although the cost of capital is included in the levelised energy cost, nonetheless, because it is likely that government and the public sector will have to make available some capital in the case of some of the larger schemes, one also has to consider the capital issue separately in terms of government priority for capital.

Ms Rhodes: I think really the point to note is that there are two figures that interest you. The first is the levelised cost, so the energy cost, and that is looking, as the Minister has said, at the cost of producing, financing and maintaining over a long period the energy you are producing but, at the same time, you need to look at the absolute cost. So what is the absolute capital cost? How much of that might fall to public and private sector? The issues you mention, such as flood protection, the restoration of the flood defences if there are any changes to flood defences during this project, would all be part of the capital cost. Therefore, in terms of financing, they would be reflected in the levelised cost but really you need to consider both.

Q8 Colin Challen: Does it include the price of carbon, which is an imponderable at the present time, of course?

Ms Rhodes: Yes.

Q9 Colin Challen: Whatever the price of carbon may be at any one time, you can be pretty sure that it is going to go up as caps are introduced and the supply of allowances is reduced. Is that factored into the kind of kilowatt hour prices where we see comparisons where the Severn barrage might be 12-14p per kilowatt hour, gas might be 3p or something? These are not necessarily fair comparisons, are they?

Ms Rhodes: It is factored in, so the intention is that yes, they are absolutely fair comparisons.

Q10 Colin Challen: What sort of price do you think at the moment is factored into this kind of approach for carbon if it is calculated on euros per tonne, say?

Ms Rhodes: We have an entirely standard price which is factored into that. It is very important for this project to ensure that those comparisons with other technologies are entirely fair and fully justifiable ones. One point I would make is that these figures will change. So far this is very much the figures we published in January in terms of levelised cost, in terms of capital cost. There are adjustments to be made. These have actually been done on the basis that we had ten different proposals and we needed a fair-basis way to compare them. As we now focus down on five, there will be a much more individual calculation. We will see no change.

Q11 Colin Challen: Could you say what the current price is that you are using in these calculations for carbon?

Ms Rhodes: I can come back to you on the cost of carbon.

Q12 Chairman: That is very interesting, Sarah. There is a standard cost to be able to do comparisons but ultimately this electricity has to be sold, so we have to have some impression of the market price of carbon going forward.

Ms Rhodes: Yes.

Q13 Chairman: Lord Hunt, this is more one for you, I think. At some point there may be elements demands for the Government to set a floor for the price of carbon. What is the current thinking on that?

Lord Hunt of Kings Heath: Yes. It will not surprise you to know that I have many people from different parts of the energy sector coming to see me to make that point, and not just in relation to renewables. As you know, the Government has said that we will of course keep this issue under review. The tightening of the cap within Europe from 2013, of course, may have a positive effect in terms of the carbon price. Equally, assuming that we make a good agreement at Copenhagen, Europe will in any case have to come back to its 2020 targets, which in itself may have an impact on the carbon price, but I can assure the Committee that we know how important this issue is. I would not seek to brush it away. We do keep this very much under review. As I say, we would hope that action in Europe will have an impact but of course, we know this is a very important issue.

Q14 Charles Hendry: You say you will keep it under review. At what point do you expect to reach a decision on it? There are people looking at making decisions now on new nuclear plant, on investing in carbon capture and storage, on a Severn barrage—they need to know with some degree of certainty where the carbon price is going to be and a floor price would provide some of that certainty. The risk is that if they do not have it, they may simply walk away.

Lord Hunt of Kings Heath: When I used the phrase “keeping under review”, I did not mean it in “Yes, Minister” concept. What I meant is that we are very alive to the issue. As I say, we work very hard in Europe in terms of 2013 and the tightening of the cap. I would say at this stage I think it is best to wait and see the outcome of Copenhagen. We can then see the extent to which Europe has to come back and harden the targets, which I very much hope it will have to do, and then the impact on the carbon price. This is a matter that exercises us very much at the moment.

Q15 Charles Hendry: Dieter Helm is advocating a low carbon obligation. Is that something which you are also looking at as a way of providing more general support to low carbon technologies?

Lord Hunt of Kings Heath: Of course, I am aware of his proposals. I do not think at this stage that we are persuaded. What is clear is that, if the carbon price itself is too low, it can have a negative impact on investment decisions and, clearly, if you look at the targets we set ourselves in terms of renewables, but also more generally on developing home-grown energy, if I can put it that way, then clearly, the

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carbon price is an important factor in this. The officials and myself are clearly very exercised about it. On the other hand, I do think that we have the mechanisms within Europe, both in terms of the post-Copenhagen targets and the tightening of the cap in 2013 as well.

Q16 Mr Anderson: Lord Hunt, the Sustainable Development Commission in 2007 suggested that this project should be publicly built and publicly run. Do you have a view on that?

Lord Hunt of Kings Heath: I think inevitably there is going to have to be public finance involved, certainly in the Cardiff Western scheme, because of the sheer size of the scheme and the capital cost. I think the evidence for the smaller schemes is that they could be financed and run by the private sector. Part of the work that we are now doing is looking at those options. Clearly, in general, in terms of energy, the energy sector is run in the private sector but with government regulation and, through the renewables obligation, incentives are put in place to encourage the development of renewables. The scale of what is being proposed here goes, I think, very much beyond what we have been dealing with in the past, so it is quite clear that in the case of Cardiff Western there is going to need to be public money in terms of availability of capital. It is also clear with the cost of the electricity generation that this will not be viable unless there is support. The renewables obligation as it is currently constructed is probably not appropriate because, in the way of these schemes, one would see a long payback in terms of capital and the schemes are expected to run for many decades, over 100 years, so we will have to come back to the issue of financing. If public money is involved, then of course there will be the question of risk transfer and ensuring taxpayer value for money. We will want to ensure that that is as tight as it possibly can be. I think inevitably we see this being very much a public-private type of partnership. The actual mechanism for that needs to be worked on further, and I think there may well be a contrast between Cardiff Western and the smaller schemes simply because of the difference of scale.

Q17 Mr Anderson: If there is an incentive, which you would need to get the private sector to buy into this, it will probably need to be a huge incentive from the public purse, so why not just go for the public purse in the first place? Over the last week in fact the Secretary of State was writing in *The Times* on Monday saying he was very concerned about CCS, and we had the decision last week to postpone Kingsnorth for three years on the basis that the demand was not there. While we are talking to each other and deciding who is going to do what, would it not be more in the public interest to bite the bullet and say if we do this, it should be publicly funded and publicly run?

Lord Hunt of Kings Heath: Mr Anderson, you raise a very important question, which goes much wider than Severn Tidal. It really concerns, I think, the

whole structure of the energy industry. Looking back over the last few years, it is clear that there has been advantage from having the kind of market we have.

Q18 Mr Anderson: I will take your word for that!

Lord Hunt of Kings Heath: I realise that we can go into a much more general debate on this issue and, of course, the recent reports from Ofgem, the Committee on Climate Change, Malcolm Wicks' report on energy security in the summer—all of these I think pose questions about the nature of the energy structure in this country, and I think the Secretary of State, Ed Miliband, has signalled that government has to have a really important, strategic role in ensuring that we have energy security in the future and that we meet our renewable energy targets, and that energy plays its role in the transition to a low carbon economy. All of those are accepted. We think of course that that also means that you need an effective regulatory system but there is also, I think, a very strong case for the involvement of private sector companies too to get the advantage of private sector investment, of the efficiencies that would come from that as well. I think the question you raise is a very important one. Coming back to the question of Severn Tidal Power, whilst it is clear that the government will have to be involved, that it is likely that public finance will be involved, I do not think it then follows necessarily that the government itself should be the operator. There are mechanisms which allow government to ensure value for money for the taxpayer that would also get the advantage of private sector expertise, and that is what we would seek to do at the moment. As I say, I think we need to come back to the Committee when we have reached conclusions, and we have a consultation in 2010 on those issues.

Ms Rhodes: I think it is worth saying what the SDC's real interest was, given that government, whether as a taxpayer or consumer, would be subsidising a Severn Tidal Power project initially. Given the long life of these projects—because we are talking up to 120 years, possibly much longer, for some of these—the SDC were really interested that there should be a financing and an ownership structure that reflects over the long term the benefit back to the country, and that is why we are looking at a whole series of different ownership structures. This is expensive electricity over the first 40 years or so while you are paying the capital costs. After that actually it becomes something rather different. You have paid for it, it you have an asset there, it is generating electricity, so the issue really is how you capture that long-term value in your shorter term ownership structure, and that is something we are looking at very carefully.

Q19 Mr Anderson: The reality is that the private sector does not have a good track record in long-term projects. How are we going to get them to actually consider investing?

Ms Rhodes: I would not necessarily say the public sector has a better track record.

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Q20 Mr Anderson: Let us talk about the National Health Service, shall we?

Lord Hunt of Kings Heath: As you know, my background is the Health Service. I think that if you look at the history of the NHS, the problem with public finance for the NHS was that not enough capital was available and therefore we went into this phase 1, phase 2, phase 3, phase 4, which in the case of hospitals that I have been involved in sometimes go over 30 years. What I think has happened with the injection of private finance is that we have had a great surge in capital expenditure. I know, of course, there are issues about the contracts, and I am happy to discuss that more widely but—

Q21 Chairman: Not today.

Lord Hunt of Kings Heath: No, no. All I am saying is that I think it is perfectly possible for private finance to bring in the capital, and for the government to provide the capital, for there to be sensible arrangements where you use people's expertise, there are proper contracts with proper arrangements, but that in the end, if the private sector is being used, there has to be risk transfer and secondly, there has to be value for money. If the public sector is putting a lot of capital in, there has to be a return.

Q22 Chairman: We are going to have a remarkable scheme at Cardiff Western if it were to go ahead, with the possibility of the government underwriting the price of carbon and providing from the public sector some underwriting of the capital. That really is a big change of position, philosophical position. It takes us back to, dare I say it, big and interventionist government.

Lord Hunt of Kings Heath: There is much to be said for interventionist and big government, Mr Chairman. I would not argue against that.

Q23 Dr Turner: If Cardiff Western were to go ahead, it would be a financial challenge of a different order to anything I can think of in recorded history. Given the estimated generating costs of about £170 per megawatt hour, that is right at the top of the range and, certainly under current considerations, current market conditions, would not be commercially feasible. It is most unlikely that you would get the private sector component of investment in that because there would be no prospect of a return from that. How are you going to get round this structural problem? Have you done any sort of market testing with the private sector to see if they are prepared to deal in such big bucks on a timescale on which they have never, ever invested before and yet see a return? That is leaving aside the credit crunch and all the other factors which lie behind the present situation.

Lord Hunt of Kings Heath: I will ask Sarah Rhodes to comment in detail but quite clearly, the scale of the capital cost of over £20 billion is huge indeed, and that has implications both in terms of the financing of the scheme over the long term, its commercial viability, the question of what support would need to be given in order to make it viable, but also, of course, in terms of the competition for capital within

government itself. So I think there are two big issues that we will need to work through and understand. What is clear is that Cardiff Western will not be possible without a considerable amount of public support in one way or another.

Ms Rhodes: I would say that, with the five projects we have, we have a different range of capital cost prices, and we have a different range of levelised cost prices. As I say, these will change as we do further analysis, as we do further work on them, and we will also need to add optimism bias to those figures, remove contingency, and do a full analysis in terms of the Treasury Green Book process. Clearly, as I say, as part of this we are looking at the ownership structures, the different interventions, the joint structures in terms of public and private sector acting together that would make this happen. We also recognise, as the Minister says, that there would need to be a subsidy process in place. There already is a subsidy process in place for renewable electricity. Otherwise, it simply would not be built. All of these processes come together in terms of how you would incentivise the private sector to be involved if you want it to, and yes, coming back to your question, we are very much taking market soundings with the private sector to understand where that balance would be, and then of course, that would factor into the decision that government has to take as to whether it is interested in going ahead and putting those supports in place.

Q24 Dr Turner: It is probably fair to say that certainly none of the present subsidy structure that exists could accommodate to something like the Severn barrage—no chance. There would have to be a very much greater public input. Have you done any comparisons of the number of extra megawatt hours you could achieve with that public money by different approaches, tidal stream power, etc, if it were applied to deployment of other technologies?

Lord Hunt of Kings Heath: Again, could I ask Sarah Rhodes to comment in detail but I think you make a very important point. Clearly, one of the issues around our decision towards 2010 is looking at the impact that any decision in relation to Severn Tidal would have on other areas of the renewables sector, and that would include issues around impact on the viability of other parts of the renewables sector. I very much agree with you that the current ROC system in its current form certainly would not be appropriate for schemes, although it is possible with the smaller schemes that the ROC system might be modified. Also, I would suggest that if we went ahead with Cardiff Western, the scale of it is so large that it might destabilise the current ROC system. We have to be very much aware of that and any perverse incentives in going for one of these schemes on the rest of the renewables sector.

Ms Rhodes: We have here on the short list one very large scheme and four relatively smaller schemes, although in absolute terms they are pretty big too. The renewables obligation already offers subsidies to tidal range projects up to 1 GW, so one at least of the short-listed projects is actually already eligible for ROCs, but we do believe that in order to make these

happen, you would probably need a higher ROC level, you would probably need a longer-term subsidy than we are now looking at. If you are talking Cardiff Western, I think you are outside the ROC system all together. I think it is simply too big; there would have to be some kind of dedicated subsidy in order to make that happen. Again, calculating what these things would be, what their costs would be, is very much part of the work we are doing now. I would just add that in the Renewable Energy Strategy we deliberately did not include Severn Tidal Power in putting the scenarios together of how you would reach the target. So at the moment there is no Severn Tidal Power in there because we do not know if we want it. What you have in setting a central scenario for how this country is going to reach 15 per cent renewable energy by 2020, is, if you like, the alternative picture, and what we are doing is comparing: is Severn Tidal Power cheaper or better than any of the other ways we have otherwise determined we think this country will meet its targets?

Q25 Mr Weir: One of the problems with many other renewable schemes is infrastructure constraints, particularly on the National Grid. Presumably, taking the case of Cardiff Western, there is going to be a huge increase in the amount of energy going into the Grid in that area. What is being done on the costs of upgrading the Grid to take that into account and who is going to bear these costs?

Lord Hunt of Kings Heath: You are absolutely right and, of course, as a result of the problems of access to the Grid an interim management Connect and Manage system was brought in. Now, because Ofgem and the companies could not reach agreement, the Government has put forward a permanent scheme, which I hope is dealing and will deal with these problems. Certainly, the scale of Cardiff Western in particular is huge and, of course, it would have very big implications for the Grid and the infrastructure that is required. There are not any published figures on the costing but what is clear is that in relation to Cardiff Western the cost of connecting and reinforcement of the Grid would run into around £2 billion at least, so clearly that is expenditure which is large and does have implications.

Q26 Dr Turner: While we are on the Grid, there is an appropriate supplementary question to that. Whether or not you have the Grid capacity, if we take Cardiff Western, if it is knocking out over 8 GW of power for, say, four hours at two o'clock in the morning, when loads are at their least, what do you do with it? How do you incorporate these massive blocks of power coming at predictable but variable intervals, unrelated to demand? How are you going to manage that in the Grid?

Ms Rhodes: Absolutely. These are questions we need to understand. There are two different approaches to this. One is to look at it as a supply-side issue; you can also of course look at it as a demand-side issue, because this would be a huge influx of the electricity on to the Grid at peak points. Some of those would

be at times, frankly, when the demand is not high, so you would need in fact to look at managing the demand; for example, over the longer term, as we go to electric cars, there clearly is much more of a demand in the middle of the night, as it were. Smart grids would help you to manage that, but really, again, one of the factors for us to understand in this study is the value of the electricity that is being produced—not just the scale of it but how useful and usable it is and what its value is.

Q27 Dr Turner: It would have to be a very smart grid indeed, would it not?

Ms Rhodes: A Cardiff-Weston barrage would be the largest power station in the country. It would be intermittent power; it would generate when it generated, although you would know well in advance when it would be generated. These are absolutely factors to be managed and understood.

Lord Hunt of Kings Heath: It would be twice as big as the existing biggest station in terms of capacity, but its load factor is about 23 per cent. These are all matters that we need to consider. I hope we will not underestimate the potential of a smart grid in the future because clearly, with smart meters, it is one of the essential foundations. I think there are going to be some very interesting things we can do in the future which will enable us to even out some of the supply and demand factors.

Q28 John Robertson: Just to go back to the general cost, you said £20 billion for a large project. This is going to suck up a lot of money and it will probably suck up a lot of money from other projects. What kind of safeguards are you going to put in to make sure that other new technologies get the development money that they need while also investing into a project of this size?

Lord Hunt of Kings Heath: That is why, when we look at the whole funding issue, there are two issues about the levelised cost in terms of producing energy but also the competition, if you like, for capital within government, and it seems to me that there are two issues there. One is about the general viability of any scheme. The question then for government would be, given what capital resource we are likely to have over the next few years, where you would best wish to place that capital. I agree with you that that would fall to be a very important strategic question for government to take. There are lots of considerations both about the viability, particularly of Cardiff Western, the question of how it works in terms of other aspects of renewable energy, but then there is the issue about capital, where government should best put its capital. I do not believe we can answer that. At this stage what we need to do is to make sure we have a process which gets as much information as possible on the table and then allows us to come to that kind of decision. However, clearly, when you are talking about £21 billion, if one could put it as an opportunity cost, it clearly is a major opportunity cost for other infrastructure projects which government might want to be involved in.

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Q29 John Robertson: One of the complaints we have had about the money that has been invested in the banks by government is that there is no control, no people on the boards of these companies. If we are going to invest the kind of money that you are obviously talking about, what kind of guarantee can you give that the government of the day will have some kind of presence within these boards?

Lord Hunt of Kings Heath: In the end, there has to be a value for money test; there has to be an assurance that if money from government is transferred into the private sector, there has to be an appropriate risk transfer and, quite clearly, in terms of these sums of money, we have to ensure that the taxpayers' interest is safeguarded. I do not think I can go into the detail of how you may do that because at the moment there are too many options. Clearly, if we decide to support a scheme, we have to come forward with much more considered proposals as to how we do secure the taxpayers' and the government's and the public's interest in this.

Q30 Judy Mallaber: How much of a problem do you think it creates for us if we do not use the opportunity of using this particular source of energy, both in terms of meeting our overall energy needs and specifically meeting the renewables target?

Lord Hunt of Kings Heath: You take us to the question of whether we are confident that we will meet our renewables target. I am confident that we will meet the renewables target. We have started from a low base but, if you look at the progress that has been made in recent years, there has been a very fast progression. We have published in our Low Carbon Transition Plan the scenarios that we see going forward to 2020. So, as I have said before you today, I am confident that we will meet these targets.

Q31 Judy Mallaber: With or without this?

Lord Hunt of Kings Heath: Without this, because we were very clear that we should not include a Severn tidal scheme as part of our planning for 2020 because to do so would be to anticipate a decision. If next year it is decided by the Government that we should go forward with one of those schemes, the timescale probably for a smaller scheme might, if it goes well, just allow for one of those schemes to be operational before 2020, though clearly there is an awful lot of work that needs to happen. We did not do that because we do not think it would be right to anticipate a decision in favour of Severn Tidal but of course—and this is really what the Committee on Climate Change said to us yesterday—if, however unlikely it is, it becomes apparent that we were not going to reach the renewable energy target, then, clearly, a factor then would be: should we at that stage consider Severn Tidal Power, but at the moment I am confident that we can meet the renewable energy target.

Q32 Judy Mallaber: What about our longer term projections?

Lord Hunt of Kings Heath: Again, the Government last week announced that, in addition to all the work we have been doing up to 2020, we are now

preparing a kind of road map in terms of energy going up to 2050 and, again, this will be factored into that. Again, Copenhagen and the impact in Europe, and then on the UK, will be a factor in that.

Q33 Sir Robert Smith: I just wonder if I can pursue the competition for resources and the other potential uses. Where does it fit into the jigsaw of the tidal stream potential between the mainland and Orkney, which is phenomenal, and also even less of a problem in terms of off and on because it flows so much in both directions, with very little slack time. I wondered how that fits into this kind of decision-making.

Lord Hunt of Kings Heath: Of course, the Pentland Firth has enormous potential, and I am very hopeful that we will within the next few years see big developments. The Crown Estate has not yet announced its licensing decisions, although I think they are expected within the next two to three months. Of course, there, with the incentivised system that is already present, one would not expect the Government to have to produce the kind of capital that is proposed for Severn Tidal. That, I think, is a very big difference. Clearly, there are lots of infrastructure issues around the Pentland Firth. We know that in relation to the way companies think they should develop it that they do need core facilities, they also need facilities to assemble turbines by the side of the port, and they need a facility to be able to bring turbines out of the sea back in for maintenance where that is necessary. So there are some infrastructure issues in which government no doubt will be asked to get involved but I think the scale of the capital involved for government is not comparable. I am very, very keen to see that we do everything we can to support developments in the Pentland Firth because of its potential.

Q34 Charles Hendry: Can we get some sort of agreement on where we are in terms of the estimated cost, particularly in terms of Cardiff Western, where the conventional wisdom has said it is about £15 billion. You have been using a figure of £20 billion. Does that include the £2 billion you referred to in terms of Grid connection? Are we therefore looking at £22 billion? Would that therefore be your considered perspective? Does that also take account of back-up storage, particularly picking up on Des Turner's point that when your power is generated at 11 o'clock at night and you actually need to store it until you want it at seven o'clock in the morning, an enormous amount of back-up facility may be required and other technologies? Is that included in that figure as well?

Ms Rhodes: The £21 billion itself will change. What is included within that is the capital cost of construction. There is also an element of compensatory habitat cost within that. There is 15 per cent contingency. What we will need to do and what we are doing is to strip out that 15 per cent and put in an optimism bias assessment. We will need to factor in things like Grid costs. We will need to factor in any other environmental costs; for example, if we

find that there are changes to flood defences, that too would be a cost on the project. So there are a whole series of different calculations that will be made, and we will see where that figure comes out. The £15 billion was actually the price the Bondi Committee put on through the work in the Eighties and indeed subsequently in the Nineties, merely updated to 2005 prices. That is no starting point for where we go, and you will not be surprised to hear that prices go up and they do not go down. So watch this one because it could well go up further. In terms of storage, there is not really that much storage capacity in the system. It is actually fairly limited. I doubt that you would actually be looking to build extra storage capacity as part of this project. You need to take a view, as I said, on the value of the electricity and whether there are supply-side measures that will change it. So the figures will change but they will not change to that extent.

Lord Hunt of Kings Heath: We obviously have a lot of work going on at the moment so when we produce our conclusions in 2010, we will have a much more considered view on the costs and the comparisons.

Q35 Dr Whitehead: Could I go further into the optimism bias which Ms Rhodes has mentioned a couple of times this morning? The Treasury guidance on optimism bias would suggest, I think, if fully implemented in the case of most of the schemes that are proposed that actually none of them would work. If you do not have optimism bias, then most of them would work. Are you optimistic that the application of such techniques gives a fair opportunity for developments to work? Is the Department applying optimism bias across all new technologies, including carbon capture and storage, and nuclear and other proposals?

Ms Rhodes: Optimism bias—it is a wonderful term, is it not?—is actually the empirically proven distance between projected and actual out-turn costs of public sector projects on average. Therefore, we ignore these things at our peril. 66 per cent is normally the optimism bias level as purely a blanket term. On the other hand, actually, optimism bias itself is not just a blanket proposition; you have to look at the elements of risk. You have to look at things like technology risk, how advanced, how risky what you are doing is, and therefore the optimism bias adjustment is very much based on your risk assessment. So simply to say it would add 66 per cent to everything is not right but we will be interested to see when we do that calculation what it does add to it. The other point you make is absolutely right: how do you ensure this fair comparison between private sector schemes and public sector costed schemes? It is what we set ourselves to do and we absolutely must do this. Quite where it is going to come out I could not tell you now. We are entirely alive to the risk that you cannot compare one set of quite carefully worked out costs with another set that are not, and we have to find a comparable point to do that.

Q36 Dr Whitehead: So is there an Optimism Bias Unit at work in the Department?

Lord Hunt of Kings Heath: Not that I have discovered.

Ms Rhodes: Our economists are on the case. It is a bit of a black art, as you might suppose, but we are on the case.

Lord Hunt of Kings Heath: I do not know if you would care for us to write to you some more about the work we are doing in this area, if it would be helpful?

Q37 Chairman: It would be very helpful if you could get an Optimism Bias Unit in Number 10; that would cheer up the occupant! Before we move on, you mentioned discussions with private sector partners. My recollection is that the initial partners, potential partners, were people in the construction sector when all this started. Again, my impression is that the generators have not been very involved in this process up to now. Are the generators involved in these discussions?

Ms Rhodes: When you say private sector partners, there actually are not any private sector partners. As you know, we are taking market soundings; we are talking to a range of organisations. I think it is fair to say absolutely that the organisations that have been involved, the Severn Tidal Power Group, have been involved over many decades; they did a lot of work in the Eighties and beyond. They are a consortium of constructors. I think it is probably also fair to say that the generators, the utilities, are waiting to see what position government takes on this, because it is clear that none of this is going to happen unless government is going to put some incentives in place and it is a question of what those incentives are and what would attract them, which we are discussing through these market sounding discussions.

Chairman: We have spent a long time talking about the economics of this, and it is clear that there are some big issues, some big, hard decisions to be taken, but alongside that, if I could caricature it, there are a set of issues around the environment and there is a view around that environmental concerns have not been taken into account sufficiently at this stage.

Q38 Colin Challen: I am just wondering what kind of assessment the Department or the government, since it might fall within somebody else's purview, is doing on the environmental impacts and how seriously they will be taken into account, because at some point a Minister may have to say the economy trumps the environment. That is normally what we do actually. What kind of environmental consideration would prevent such a scheme from going ahead?

Lord Hunt of Kings Heath: There clearly are some major environmental questions that need to be considered, and part of the work that is now being undertaken is indeed to get some thorough analysis of what environmental impacts there are likely to be and then, given the various Directives and legislation that applies, to see whether it is at all possible that one could go forward. This is a very important consideration. Yes, there is a cross-government working. Clearly, my colleagues in Defra would be taking a particular interest, as indeed are the Welsh

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Assembly, because some of the proposals clearly have an impact in Wales as much as in England. There are some environmental benefits in terms of renewable energy, long-term access to renewable energy, and it is even said that, because of some of the structures taking place, there can be some benign environmental positive impacts as well. On the other hand, this area is a huge home to many birds who feed there, there are issues about migratory fish and, in terms of taking this forward, we have to look very carefully at the environmental implications. You then have to apply the legislation and, essentially, if you cannot avoid or mitigate effectively some of the environmental impacts, you are then required to look at whether compensatory measures can be taken. If compensatory measures cannot be taken, we are then looking at the concept of equal value: if it is not possible because of the scale of some of these projects to make compensatory balancing, could you look at other parts of the country or elsewhere to make provisions for other species, for instance, which might be seen to be of equal value for the environmental damage that is being done by one of these developments? That is all part of the work that we are now doing and, of course, it will have to form a major part of our judgement because, on the one hand, one might be able to work through that one or more of these schemes is going to be economic or viable, that it can contribute to the development of renewable energy, that it can bring a net increase in jobs in the region, but, having gone through that, you have to satisfy yourself that we can actually bring a scheme to fruition and meet the environmental legislative requirements that are there. In this case I do not accept that the economics trumps the environmental issues. The environmental issues will be just as important a factor.

Q39 Colin Challen: You have said this morning that it is highly unlikely that any Severn scheme is going to be producing electricity by 2020, so it is not being factored into our renewables targets by that point. What would you say to people who say actually, this scheme is going to contribute so little to solving the global problem of climate change that it is simply not worth doing anyway?

Lord Hunt of Kings Heath: I cannot say that at the moment. I believe more work needs to be done. It is possible that one of the smaller schemes could just about be ready by 2020. It is worth making the point that, of course, we started with a positive view from the Sustainable Development Commission about a Severn Tidal project, so coming from their independent judgement, they thought that it was sustainable but, clearly, there are any number of factors to play here. I do not think five per cent of our electricity needs could be described as being insignificant. If this could be brought off at a cost that was affordable, and without unacceptable environmental damage, clearly, it has many attractions but I cannot as yet make the kind of judgement you are inviting me to make. I do think we need to go through this work in the next few months before we could come to a conclusion.

Q40 Judy Mallaber: Last week I was in the south-west coastal region of Bangladesh and as a result of the very best of motivations, work that was done around the coastal environment and so on in the Sixties has actually ended up mucking up the whole ecosystem of that area—the river patterns, the river flows, waterlogging fishing patterns. How confident are you that you actually can know what will be the long-term environmental impact of these proposals, given the size and nature of them?

Ms Rhodes: The first point is that, absolutely, you can never be confident. You have to accept that even the best analysis—and we are doing the best analysis—will not necessarily answer every issue. We have an enormous raft of environmental experts helping us to understand the environmental impact. I would say many of them are in this room now. We have all the Government's environmental advisers, we also have many NGOs, and we have lots of other experts. We have involved all expert stakeholders who are willing to be involved in this work so that we can try and ensure that we have the best possible analysis. We are also looking at other relevant projects, so a whole series of projects—there are not that many barrages around the world but we are looking at those. We are also looking at other relevant projects, for example, storm surge barrages that were built on the Dutch coast, particularly the Eastern Schelde, so a whole series of parallels. We are looking firstly at what happened there, how you can build that analysis into your own, and secondly, how good their assessment was at the time, how much did they see coming and how much did they not see coming. Also, beyond all of that you simply have to say there will be things we get wrong here. What are the consequences of what is unknown? What are the risks? Who bears those risks and are we willing to accept those risks? If you like, there is a tried and tested assessment that you make, building in what you know you do not know.

Q41 Judy Mallaber: What are you being told at the moment is the potential impact in increasing the risk of flooding?

Ms Rhodes: We are looking very carefully at flooding, and one of the main determinants of flooding will be what happens to the structure of the estuary, what happens to the sediment in the river, how that falls out, what that might mean in terms of accretions and in terms of erosions. All of these things need to be understood. What we already know is that in terms of upstream fluvial flooding, so the type of flooding that affected Tewkesbury, we do not see any impact at all because, although you might potentially be putting a barrier in the river, the estuary itself is so broad that it would not, we believe, drain more slowly in respect of getting rid of that upstream flooding. In terms of flooding from the sea, some of these proposals would have benefits. Beyond that, we really need to understand, as I say, this question of what happens to the structure of the estuary, how far any of that is putting pressure on any flood defences because, clearly, if it is putting pressure on the Environment Agency's plan, that must be a project cost to remedy that and to make

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sure that you restore the defences to the same level of strength that they are anyway planned to be. The project would therefore have a neutral impact at worst and a positive impact at best.

Q42 Judy Mallaber: What worries you most about the potential dangers that you see from the project at the moment, the things that you are really going to be looking at in terms of potential adverse impact?

Ms Rhodes: The big area for us is actually this one of geomorphology and sediment: how does the estuary actually behave? The reason why this is such a brown section of water, is that it has an enormous amount of suspended mud in it and with these vast tides, 14 metres, 45-foot tides, that is an enormous swill of mud. So where that mud goes and what the impact of a structure is on the estuary bears on a whole series of things. It bears on flood defence, it bears on the biodiversity, what the biodiversity impact is, it bears on navigation impacts as well, so all these things. That is the one area that you understand best. It is an enormously dynamic river now. So, again, we have all the experts we can find, including the local ports, involved in advising us on how best to make that assessment.

Lord Hunt of Kings Heath: It is worth making the comment that, in terms of the economics for the region, whilst at the moment the work that has been done so far forecasts a net additional number of jobs, of course, there will be disbenefits in the impact on the fishing industry and also the ports involved, so that in terms of the eventual judgement, those are issues we also need to take account of.

Q43 Anne Main: I was quietly intrigued to hear about factoring in what we do not know, because many people have concerns over any large development projects. There is indeed an optimism bias there against biodiversity and, when you have the prospect, as Lord Hunt said, of perhaps relocating something that is considered unique, unusual, and specific to an area, that has come about for a variety of reasons, if it could be easily recreated elsewhere, it would have been. It is because of this uniqueness that many people feel it is almost impossible to recreate. Could I ask, if you are going to import optimism bias, that you factor that in? I have concerns, and I would like to have your views on this, that regularly there is the thought that if we cannot sort it where it is, we can just put it somewhere else, and then we will have birds or newts or whatever it is that you are relocating, and they will be over there so that is fine. Can I have your view on that? It was such a strange phraseology you used about factoring in what we do not know, and I just do not know how you are going to calculate that, or is there going to be an up-front honesty to say, "I am sorry, the birds lose and the electricity wins"? When we have concerns about lecturing people about chopping down Amazonian rain forests, are we doing the equivalent on our own doorstep?

Lord Hunt of Kings Heath: Actually, I do not take that as being our view at all. What we are saying here is that we recognise that the scale of this undertaking is in many cases so big that there are a huge number

of factors that need to be built in to considering whether we should go ahead. We have heard about some of the issues around environment, the issues around flooding, and, as Sarah Rhodes has talked about, some of the issues in terms of the whole nature of what would happen to that area if one were to engage in the kind of constructions that are being talked about. I can assure you that, on the environmental issues, this is not a matter to be taken lightly, and indeed, even if we were to take it lightly, the European legislation is very clear in relation to Habitats Directive, the Birds Directive, and indeed other aspects of European legislation, that the environment cannot be taken lightly. What I was saying is that, in relation to the way the Habitats Directive works, if by going ahead with a scheme the environment were to be damaged, the first stage is to look at whether that can be avoided or whether mitigating measures could be taken. The second stage is whether, if not, compensatory measures can be taken. The issue for us is that the scale of some of these projects is so large that we might not be able to make compensatory measures, therefore this concept of equal value is being developed, but I can assure you this is not being taken lightly. It is not as if we are saying before you today that we are so determined that we should go ahead with one of these schemes that we will find any way we can to get round the environmental legislation, and we have just developed this concept of equal value as a way of doing it. That is not the way we are working at all.

Q44 Chairman: As you have said, this is a SPA, and it is hoped that it may become a SAC in the future. If that is the case and a scheme goes ahead, there is going to be litigation on this—let us be clear about it. Some of the environmental organisations are not going to acquiesce.

Lord Hunt of Kings Heath: That is a very realistic assessment. I am always working on the basis that judicial review is just around the corner and, quite clearly, I would have thought, on the environmental aspects, if a decision was given to go ahead, of course, that is very much likely to be challenged. That is why we need to be very careful about our approach and why there is no question of us seeking to get our way round environmental legislation. We would want to make sure that we do everything right and that we do everything we can to protect the environment.

Q45 Anne Main: If you do not know what you do not know, how do you know what is going to happen?

Lord Hunt of Kings Heath: I guess this is the unknown unknowns question. The issue is that we will do everything we can in terms of our current understanding of the science to be able to make the kind of forecast which would enable us, we think, to make a rational decision. Of course, I cannot sit here and say that within a few months' time I know absolutely what the impact of going ahead with one of these schemes will be on the environment in 100 years' time. I cannot do that. All I can do is ensure

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that my officials and advisers are using the best information and science possible in order to make a judgement.

Q46 Anne Main: Our knowledge of the marine environment is considerably less than of the land environment, so you are looking at using science that is evolving very rapidly now. We still do not know why whales are beaching and we are still worrying about noise out at sea. That has been going on for a long time. You are looking at trying to extrapolate current science, which is already quite thin on the ground in a marine environment, into a future project that is going to have a vast impact.

Lord Hunt of Kings Heath: You tempt me into a debate on the Marine Bill.

Ms Rhodes: Ultimately, we will do the assessments, we will cost assessments but, equally, this will come down to a value judgement. It will come down as to how each one of us would trade off the environmental benefit versus the environmental damage. There will be an absolute level of damage. That is unavoidable. This is a unique environment. If we construct in this river, it will change. That is why, in a way, we go out to consultation and each of us needs to make that value judgement, and the trade-offs have to be accepted and understood. I would also come back to the fact that the Sustainable Development Commission published their own view, and that was that they thought it was worth doing.

Lord Hunt of Kings Heath: And of course, you have to put it in the context of reducing carbon emissions. If we cannot reduce carbon emissions, we are in a very difficult state indeed. We have to set it in that context as well.

Q47 Judy Mallaber: Are there key points and, if so, what are they, in the environmental legislation that could just stop it in its tracks? What would they be? What are the killer points in the legislation on this project?

Ms Rhodes: The question is could it comply? The Severn scheme is actually unprecedented in terms of scale. To be contemplating this type of development in a heavily designated area is unprecedented, therefore it is off the page in terms of what legislative compliance might be. There is Commission guidance although it is not statutory guidance. That certainly points you to the need to over-compensate because of the risk to the environment and because wildlife might not transfer, but in a way we are still feeling our way to what actually a rational and responsible position is in terms of compliance and again, as the Minister said, we are looking at this from several angles, what is the prospect of like-for-like compensation, which is what the Habitats Directive envisages, and what is the prospect for doing something beyond like-for-like. Again, this is all thinking and we have yet to take a view on whether we accept that thinking and whether we accept the values behind that thinking. This is all part of the analysis that we are doing but that question of

regulatory compliance is a very significant one and we certainly cannot assume that these projects would necessarily be consented.

Lord Hunt of Kings Heath: Clearly the risk here is that consent is given and then it is challenged within the European Courts, and of course what I need to do is to satisfy myself that if we were going to go ahead with a scheme that we had a robust enough approach on the environment that I could confidently assess that we were likely to be able to defend ourselves effectively within the European Courts. I think that is the way we will approach it.

Q48 Judy Mallaber: Then there is presumably a second phase which is how much would it cost to provide the necessary compensation and that will presumably be fully costed out in the proposals?

Lord Hunt of Kings Heath: It needs to be involved in the whole discussions about the funding of the scheme, yes.

Ms Rhodes: There is already an element of compensation included in the cost figures that we published in January.

Chairman: We have talked a lot about the economy and the environment and you told us that this would make an enormous contribution to our renewables target probably up to 2020. There are implications for other renewables in that. Can we pursue that a bit. Mike, would you like to start?

Q49 Mr Weir: How do you see it fitting in with the Government's strategy for meeting the target of 15 per cent of energy from renewables? You did say earlier that the current target did not include the Severn. Do you see it coming in within the timescale for meeting this or will it substantially change and how does it fit in with the EU Directive?

Lord Hunt of Kings Heath: There are two things here. One is it depends if we went ahead with a scheme which scheme it would be. If you look at Cardiff-Weston, one would have to say that, given the scale, there are a number of stages. One is that the Government has to reach a decision that it was going to support a scheme. It then has to work through the regulatory consent regime and the funding regime, and that in itself might need primary legislation, so that will take quite a considerable time as well, and then there is the construction time. On the biggest scheme I would have thought it was very unlikely that it could be up and running by 2020. On the smaller schemes, although challenging, I think it is possible that one of those schemes could be up and running by 2020. Clearly 2020 is an interim target. We are on a journey towards a low-carbon energy structure, so that even if one of these schemes was not able to help us towards the 2020 target, it could help us in the next phase going up to 2050. At the moment there are two reasons why no provision is made in our 2020 target for the Severn. One is that it would be wrong for us to put it in because that would have anticipated any decision that we make, so we must go through a proper process of decision-making. Secondly, we are confident that we can reach the 2020 targets we have set within the current policy on renewables. If, as the Committee on

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Climate Change has suggested, it becomes apparent that at some stage we are going to have a problem there, even if a decision had been made not to go ahead at the moment with Severn tidal, of course you could re-visit that decision in that light, so I think that is the approach we are going to take.

Q50 Mr Weir: Given that we are coming up to Copenhagen where we are looking for a worldwide fairly massive reduction in carbon emissions, would it not be more pragmatic to invest in low-carbon technologies that have more export potential and perhaps can deal with this quickly? You are talking about a very long timescale for at least the Cardiff-Weston project where given all the matters you have suggested 2020 would seem to be a very ambitious target for that. Would that not be a more pragmatic way to deal with it and lead to reductions quicker?

Lord Hunt of Kings Heath: One of the factors for us is to look at what impact developing one of the Severn Tidal projects would have on the rest of the renewables sector. What we do not want to do is to cause problems in terms of perverse incentives or displacement, if you like, for the rest of the renewables sector. The decision about the Severn must be made partly in relation to any impact that it would have on the rest of the renewables sector. The second point I would make is that I am confident we will meet the 2020 target but it is a very tough one. We are talking about, if one moves on from the 15 per cent target on energy, around 30 per cent in relation to electricity. At the moment in 2008 approximately 5.5 per cent of our electricity use came from renewables, so this is a huge ask to go up to 30 per cent in what is now just over ten years.

Q51 Mr Weir: The Committee on Climate Change said this week that a step change was necessary to try and meet this target. Does that not suggest that investment should go into existing technology rather than a massive project like this which at best will be very many years away?

Lord Hunt of Kings Heath: You are pushing me to go where I do not quite want to go because I do think that we must go through this and then come to a decision. I have already made clear that what I would not want to happen is for a decision to go down the route of the Severn to have a perverse and negative impact on the rest of the renewables energy sector. I also believe that we are involved in a step change in terms of renewables. Yes, we have a long way to go, but we are seeing a rapid expansion in the use of renewables. In terms, for instance, of offshore wind we are now the world leader. We are seeing many applications coming forward. I am still optimistic about wave and tidal energy, and we have discussed the Pentland Firth, so overall I remain confident that the step change that the Committee is asking for is very much in train.

Q52 Dr Turner: On the same question, Philip, I am very glad that you are anxious that any decision on the Severn Barrage should not adversely affect the development of other renewables. Would you agree that is the problem to avoid? I think the same is

probably true of nuclear programmes as well, none of which will deliver before 2020 but which will involve the commitment of enormous quantities of finance that will therefore not be available to the renewables sector which were they more available to the renewables sector could mean the deployment of a great deal more renewable energy, whether it is wind, marine energy, or whatever, in the period leading up to 2020 because there is not an infinite financial capacity available and there is already anecdotal evidence at least that what I call the nuclear "blight" is actually happening.

Lord Hunt of Kings Heath: Perhaps I could ask Sarah Rhodes to talk a little bit about how we are going to take forward the work on financing these judgments. I would just say that of course the first nuclear power station is due to go live at the beginning of 2018 so in terms of its low-carbon impact, although it will not meet the renewable target, it will have an impact in that area. I think what you are talking about is competition for capital and clearly this is a tough time for companies in terms of raising capital. I believe that because energy is very much a long-term investment that we will see the required investment. We are looking very closely at the Ofgem report in terms of what they said last week about the size of the capital investment, but in terms of us making a judgment about whether we support a scheme here, I would just reiterate that one of the factors that we will consider is what impact it has on the rest of the sector.

Ms Rhodes: All I would add to that really is that of course we already have in place or are putting in place the measures that we believe are necessary to deliver 15 per cent renewable energy, so a whole raft of support schemes and subsidy mechanisms are all now being put together and being implemented, so we have already got the measures in place and, as the Minister says, we will obviously watch very carefully the progress of those and consider the need for more or different. Severn Tidal Power, in a sense, is over and above, would we want to do more and we would not thereby really reduce the amount of public funding that is available for renewable energy. You are absolutely right that the issues of where the capital is coming from and whether there is competition for capital would need to be considered, but let us just remember the enormous scale of what we have to do to build a new energy infrastructure. It is absolutely vast and there is already an enormous programme underway. Whilst it would be material Severn Tidal Power is not going to change that fundamentally.

Q53 Mr Anderson: I think we are all happy to hear Lord Hunt say that he would not want to get into perverse negative effects on renewables. Can I ask you about other low-carbon technologies, in particular the use of coal. If there is going to be competition for funding, whether it is private or public over the next period, then clearly if we parked the Severn as an issue and said let us leave that for the future, we would then encourage public and private investment in CCS but also in the underground gasification of coal which might

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possibly be cleaner than even CCS would be but also would access billions of tonnes of coal worldwide and not only would that benefit this economy but it would also be transferable technology. Is that not also an issue to be taken account of?

Lord Hunt of Kings Heath: Yes, I think that is a very fair point to put. The Committee will know that my Secretary of State is very committed to taking forward carbon capture and storage, particularly of course at first in relation to coal. Not only is it important in terms of energy security but also because of the potential leadership role this country can take and the potential for jobs and exports and also because I do not see how we can hope to tackle the worst impacts of climate change given the amount of coal that is being used at the moment and will be used in the future for power generation unless we can show that CCS can be developed at scale and in a way that makes the funding and the technology work. CCS is very important. We have been hosting with Norway in London in the last two days a meeting of the Carbon Sequestration Leadership Forum. I think the message at that forum is very clear; that we want to encourage countries to get on with scale-up technologies and, as you know, we have just finished a consultation on the funding of the up to four scale-up projects that we want to see developed in the UK, so we are working very much on that at the moment. I certainly believe that developing CCS is hugely important strategically for this country.

Q54 Charles Hendry: You have said a few times now that one outcome of the consultation could be to put this on hold and in the event that your confidence is misplaced about the renewables target it could be brought back on-stream at a later date. Is not the reality though that if it were delayed it would then be too late for it to meet the renewables targets? You have said already that small projects might just be able to come on-stream by 2020. If you build in two or three years' delay that clearly would then not be the case. There is provision for the five projects but then they have to have started construction by 2016, which would be completely unachievable if a decision were put off to 2013 perhaps and they have to be operational by 2022, which will again be unachievable, so is not the reality that if there is a delay then the Severn Barrage, or any of its options, could not hope to meet those renewables targets?

Lord Hunt of Kings Heath: It is very challenging for 2020. You can construct a timetable, particularly for the smaller schemes, that could show that some of them could be generating electricity by 2020, but clearly I am not quite sure how much optimism bias one needs to put into that in order to get to 2020. I think the point here is that we very clearly did not include any calculation for Severn Tidal within the 2020 target, but of course there will be other targets going beyond 2020. In the work that my Department is now doing in setting out a route map to 2050 and looking at what our energy needs are likely to be, what the mix should be, clearly the role of renewables will be very important. It could be that even if none of these schemes could be ready by 2020

that as you go forward nonetheless it might become an important factor. I think it would be wrong to rule that out at this stage. Equally, none of the work that has been done since 2008, even if a decision were taken next year that it was not thought viable to go ahead at this stage, is going to be wasted for the future. In other words, this clearly is not a once-for-all decision. It cannot be a once-for-all decision.

Q55 Sir Robert Smith: It is once-for-all if you build it. You mentioned with some of the other technologies the export potential that you are also eyeing up for CCS and so on and so forth. In the nature of this project, if you opted for the smaller ones, would you not actually be working in an area where there would be more export potential than maybe if you went for the bigger ones?

Lord Hunt of Kings Heath: I will ask Sarah Rhodes to comment because we obviously have done some work in relation to the supply chain potential. I think it would be fair to say that no other country has really embarked on a scheme of the kind of scale that is envisaged here. I think there would be a lot of international attention on what we do, both in terms of the engineering issues but also in the way in which we tackle environmental issues. Clearly I would hope that if one of these schemes went ahead that the UK supply chain would be in a very strong position to take advantage of it, but also that because really in terms of the scale this would be world leadership that there would be potential for exporting both the technology but also the intellectual knowledge that we gain. I think that the Pentland Firth and that exploitation equally, just as the subsea sector in the North Sea has proved to be a huge export earner for us because of being able to develop these skills in our waters and being ahead very much of other countries in many ways, yes, does have a big potential.

Chairman: Let us move on and talk about carbon reductions. Judy?

Q56 Judy Mallaber: What about how emissions will be reduced if we do not support the Severn project, what are your main areas of dealing with that?

Lord Hunt of Kings Heath: It must be the same answer as on meeting the renewable energy targets. Clearly the more we can develop renewable energy or nuclear energy or low-carbon energy, obviously the more impact it has on our emissions reduction targets, but, again, I think that what I could not say is that the development of one of these projects is essential to us meeting our emission reduction targets.

Q57 Judy Mallaber: You have been talking about that in relation to up to 2020 but in terms of your initial projections beyond 2020?

Lord Hunt of Kings Heath: Again, Sarah, I do not know if you want to say a little bit about the work beyond, but clearly, as I said in relation to renewables, we must not discount the positive impact that developing one of these schemes might have in the period beyond 2020.

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Ms Rhodes: We are looking of course very closely now at what we expect the demand picture to be up to 2050 so far as we can calculate it. When we get beyond 2020 what we are saying is that there will be three different sorts of generation. Our plans are nuclear, carbon capture and storage and renewables. Nevertheless, it has to be said that there are risks around the delivery of these. Carbon capture and storage for example is yet to be demonstrated at scale. If it is not possible to do what we expect to be able to do, Severn tidal would be a way of dealing with the risks of other schemes and other technologies not being able to deliver as we think.

Lord Hunt of Kings Heath: On CCS we would like, provided that all goes well, the independent evaluation of CCS to take place around 2020.

Q58 Judy Mallaber: If with all the planning we become confident both up to 2020 and in the longer term projections that we should be able to meet our ambitions in relation to carbon dioxide emissions, would you then think we should just abandon the Severn Barrage project because of its potential impact on the environment?

Lord Hunt of Kings Heath: Although I know that we are going to do a lot of work to try and anticipate the future in terms of environmental impacts, I do not think I could say today what decision will be made in 2020. After all, climate science is improving all the time. I do not think one could sit here and say that there is a situation in which you would always rule out the development of the Severn, but I do think, as has been discussed today, that you can begin to see some of the enormous challenges that will need to be confronted in taking forward one of these schemes and that in making a decision there is a great deal of tension between desirable objectives. Any decision is going to be a difficult one but I would not wish to say at this stage that if by 2020 it was clear that we were meeting our renewables targets and the energy reducing emissions targets that on that basis I would rule it out from that period on going down this route. I do not think I could say that.

Q59 Judy Mallaber: So it will always be kept in the filing cabinet?

Lord Hunt of Kings Heath: Also from the point that no Government can really commit its successors, I do not think you could say for all time this will not happen. After all, I have been given a time-line by my Department as to when the Severn was first talked about and it is almost as long ago as House of Lords reform, so people—

Q60 Sir Robert Smith: Will you outlive this?

Lord Hunt of Kings Heath: Who knows!

Q61 Dr Turner: Philip, I wonder if you could comment, I am looking at a graph here of the results of modelling produced by your own Department which shows that with a Cardiff-Weston Barrage the actual total CO₂ savings up to 2030 are actually less than without. That is a scenario produced, as I say,

by your own Department. It is in the Severn Tidal Feasibility Study. I wonder if you could comment on that?

Lord Hunt of Kings Heath: I will ask Sarah to comment on that.

Ms Rhodes: The reason why of course is that we assume that since we have projections that will take us at 2020 to 15 per cent renewable energy that all we are doing in a sense is not gaining extra carbon reduction, we are simply displacing the carbon reduction, so that is the basis for that assumption. One thing to bring in there is that clearly there would be a carbon impact from construction and that too we are assessing but actually it is surprisingly short. The SDC did some work on this in their study and in fact they placed it at less than a year before you get carbon payback. Your question is really around are we expecting this to be a new carbon reduction? No, we are saying there are other ways of doing it and we are assuming in those figures that those other ways are being displaced.

Dr Turner: Your Department's figures suggest that even after the barrage was commissioned the CO₂ savings would be less than without one between 2022 and 2030. I am just looking at the graph that your Department has published.

Q62 Chairman: We will let you have the graph.

Ms Rhodes: It might be handy if I could see the graph.

Q63 Chairman: We will send you the graph and maybe you can comment on it.

Ms Rhodes: I will.

Q64 Chairman: We will talk very briefly about socio-economic factors and then we will talk about developing technologies, which is an issue that you raised, Phil, and then we will finish. You acknowledged earlier on that if one of the schemes went ahead there would be some new jobs and some jobs that would disappear. How robust is your thinking around that? Most particularly, are people at the Port of Bristol right to be concerned?

Lord Hunt of Kings Heath: Yes, I think clearly that it could have an impact on the Port of Bristol which, as you know, is a very thriving port and indeed has an application for a deep sea container terminal with the Department for Transport at the moment. First of all, we have made it clear that if, for instance, particularly if you have a barrage going right across the Severn below the port, that we would expect locks to be built into that barrage but, nonetheless, locks could only be used at high tide, so clearly that would have an impact on the Bristol Port which needs to be taken into consideration. I believe it would also have some impact on ports in Wales as well, so, as I say, in terms of sustainability and in terms of jobs, although the figures that have been done so far show a net gain in jobs, particularly over the construction period, with a small net gain once the scheme is completed and it is into normal running, there clearly is going to be a negative impact particularly in the ports but also in the fishing industry as well. In terms of the robustness, DTZ has

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undertaken some work and it has been peer reviewed, but clearly it is a very important factor in any decision that we make next year, so we are looking very thoroughly at this.

Q65 Chairman: You have made £1 million available for Severn Embryonic Technologies funds. Tell us how that is going and what that is for?

Lord Hunt of Kings Heath: Essentially, environmental groups have clearly been concerned about the environmental impact of some of the schemes being proposed. They have put forward proposals for schemes which they believe to be less damaging environmentally. In terms of the criteria under which we moved from a long list to a shortlist where we were setting essentially a feasibility test, the understanding of these new embryonic technologies has not been developed so that they could meet the feasibility test, so the studies (we have put just over half a million pounds into them) are designed to give us a feel for whether these technologies really have prospects and, as I said at the beginning, if as a result of those studies it appears that in the rather longer term that they may well be able to produce what is often claimed in terms of both generating power but also much less damage to the environment, one of the judgments that could be made is we do not think at the moment it is viable to go ahead. But because one or more of these embryonic technologies really does look promising and more work needs to be done to see if it is going to work, then one of the decisions might be to say that we are not going to go ahead at the moment but we will see further work in relation to one of these technologies and we will come back to a decision later on.

Q66 Dr Whitehead: This is a bit of a problem for development overall, is it not, in terms of the timescale that we have already heard about when you think a barrage of some description may come on stream. In that context it would appear that five schemes have passed the 11-plus and we have said to three schemes, "Well, you have not passed your 11-plus but maybe you can take the exam at age 13 and you can get back into the grammar school again," and then we have said to eight schemes, "Go away." The three schemes that are on the SETS funds list are all low environmental impact schemes, when an environmental impact assessment had not really been done when the five original schemes were shortlisted. Are you confident that putting £500,000 (roughly £160,000 a scheme—the salary of a permanent secretary) into those schemes, some of which I think are widely thought as supplying a very substantially lower environmental impact, fewer moving parts, less concern to tidal streams, less concern to shipping indeed, will actually produce results such that a scheme could come back into serious contention within perhaps three years?

Lord Hunt of Kings Heath: I think half a million pounds nonetheless is still a substantive amount of money. The point about it is that I believe that it will be sufficient to give us a feel, at the very least, as to whether it is likely that one of these embryonic technologies looks like it has potential in the future.

Of course at that point, particularly if at that stage we decided not to go ahead with a scheme, we could say that we think it is worth coming back to this because we want to actually see further work done in relation to an embryonic technology, and I think that is a quite reasonable approach. This is not a promise of more money in that direction but certainly we ought to see the outcome of this work. The work will be thorough enough in order for us to make a judgment as to whether it is worth thinking further down one of those technology routes. One should not under-estimate the issue that we want to really see if the technology has real potential. Is it really likely to be feasible? Of course, if it is and there are genuinely fewer environmental impacts, then it deserves full consideration. I know this does feel like a rather convoluted approach with both the long list and then coming to the shortlist, then having feedback and then having embryonic technologies, but going back to the issue about what do we know for the future, it seems to me that this area is so precious, both in its potential but also in environmental terms, that you do have to have a very rigorous process. I think, to be fair, because there are issues that are unknown at the moment, we do have to have opportunities to allow schemes that at first we rejected from the shortlist to see if there is further information becoming available that would suggest that we should bring them in. It is taking a long time but the scale of this decision is a very, very big one and we have got to get it right.

Q67 Anne Main: I would just like to pick up on the embryonic technologies because with the more invasive scheme, if I can put it that way, you are also reliant on embryonic technologies such as smart metering and the greater use and uptake of electric cars and potentially altering the demand side of people consuming electricity. There are an awful lot of variables in there that you seem to have parked whereas this seems to be not getting the degree of scrutiny that the larger scheme gets and yet on the margins that relies on embryonic schemes in just the same way.

Lord Hunt of Kings Heath: I am not sure that I would accept that, although of course you are right that smart meters are a very exciting development for this country and they have received a lot of support.

Q68 Anne Main: We still do not know how it is going to work though, do we?

Lord Hunt of Kings Heath: We know a little bit more and we have had a consultation and we will shortly be publishing the outcome of that. I think it is rather different. We know enough about smart meters and their potential to be pretty sure that they can bring big advantages.

Q69 Anne Main: Yes, but you are relying on them and cars using electricity that may be generated as a surplus if it is licensable.

Lord Hunt of Kings Heath: Yes. I think that that is entirely reasonable. From all I have learned in the time I have been in this job and from what is happening internationally, I do not think anything

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we are doing in relation to smart meters or a smart grid or, as you say, the kind of balancing that would need to take place if electric cars really did take off in the way that some of us hope, is not based on knowledge and technology. In relation to the Severn and some of the technologies there, there is a scale of degree of embryonic that we need to test out some more. As I say, I think the safeguard that you have got is that this is such a rigorous process and that it is a transparent process. There will be a public consultation after we have come to a conclusion in 2010. We have got a lot of scientific advice available to us and what I am convinced of is that we will be able to come to a robust decision based on as hard an evidence base as we can get.

Q70 Sir Robert Smith: What is the timescale for the delivery of the results of the SETS investment in terms of when do you actually expect it?

Lord Hunt of Kings Heath: Early next year because we need it in order to inform the 2010 decision.

Ms Rhodes: One final point on that, the difficulty of assessing the embryonic schemes in the same way as the other ones is that we simply do not have an outline design for them. During the process over the last year of assessing these they have moved location, they have moved from the Cardiff-Weston location up to the Minehead-Aberthaw location, and as you encounter an issue the design changes.

That is absolutely fine, that reflects the state of development, but it does mean that you cannot do an environmental analysis because you do not know where they are. That is why we took those out. We said they are too much of a technology risk now but let us put some money and some time into developing a design and let us work out what is the route map to the future, what would need to happen in order for these things to happen and in what timescale. The half a million is about the right amount. We have topped it up, we have ended up putting more in, and we would have put even more in had we needed to but we have not.

Q71 Chairman: Phil, Sarah, it has been a very hard-working session. I understand it a bit more now so thank you. We are going to send you a graph with some questions for your comment. In return you promised in your comparison modelling between schemes that you are going to give us the price of carbon that you have assumed in that. Phil, you have said that you have got to make a decision in 2010. You have told us that several times. I am a bit of a sceptic about this. Given the scale of the decision and the complexity, best of luck in making a decision in 2010 and do not let it slip!

Lord Hunt of Kings Heath: Thank you very much, Chairman. I deliberately did not say when in 2010, I think that was advisable! Thank you very much.

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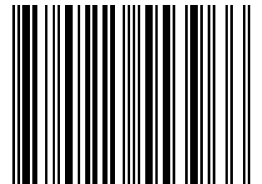
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