

HOUSE OF LORDS
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TAKEN BEFORE
THE SELECT COMMITTEE ON ECONOMIC AFFAIRS

THE ECONOMICS OF RENEWABLE ENERGY

TUESDAY 15 JULY 2008

MALCOLM WICKS MP, MR SIMON VIRLEY and MS TERA ALLAS

Evidence heard in Public

Questions 472 - 508

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TUESDAY 15 JULY 2008

Present

Best, L
Griffith of Fforestfach, L
Hamwee, B
Lawson of Blaby, L
Layard, L
MacDonald of Tradeston, L
MacGregor of Pulham Market, L
Turner of Ecchinswell, L
Vallance of Tummel, L (Chairman)

**Memorandum submitted by Department for Business Enterprise
and Regulatory Reform**

Examination of Witnesses

Witnesses: **Malcolm Wicks**, a Member of the House of Commons, Minister of State for Energy, **Mr Simon Virley**, Head of the Renewable Energy and Innovation Unit, and **Ms Tera Allas**, Chief Economist Energy Group, Department for Business Enterprise and Regulatory Reform, examined.

Q472 Chairman: Welcome, Minister, and your officials. Thank you very much for spending some time with us this afternoon to answer our questions. Thank you, too, for your written submission that came earlier. I believe you would like to say a few words before we start, and we would be very happy if you do just that.

Malcolm Wicks: If I could just spend a couple of minutes on that, my Lord. May I thank the Committee for giving us the opportunity to talk to you and discuss with you the topical issue about the cost of renewable energy. May I introduce my two colleagues who are with me: Simon Virley is the Head of Renewable Energy and Innovation Unit in the Department for Business and Enterprise, and Tera Allas is our Chief Economist in the Energy Group. Over the last few weeks this issue of renewable energy has become headline news, as we have just

published the consultation on a UK Renewable Energy Strategy. We are seeking views on a wide range of measures that will enable the UK to meet our legal commitment to the EU's target that 20 per cent of Europe's energy should come from renewable sources by 2020. Our proposed share of this target is likely to be 15 per cent, and I know the Committee Members are aware that this is a challenging and certainly ambitious target, but it is a target that the UK was instrumental in designing and we are committed to meeting. No doubt you will have seen the newspaper reports that accompanied the publication of the consultation. We have not tried to hide the fact that meeting this target will require additional investment from the private sector to the tune of, over time, £100 billion. While it is unlikely to impact energy bills before 2010, in 2020 both gas and electricity bills will be higher due to the cost of renewable energy, and it is important to recognise that. That said, we remain committed to meeting the target and significantly increasing the use of renewable energy in the UK over the next twelve years. Underpinning this strategy will be the aim to achieve this step-change in the most cost effective way. Decisions on renewable energy cannot be made merely on the basis of cost in the short term; it is about tackling climate change and securing energy supplies for the future. The Stern Review into the economics of climate change was absolutely clear that we needed to invest now or else pay a higher price later. We are clear that we will need renewables but they will not be the only solution; we also need a range of other technologies including nuclear and including carbon capture and storage if we are to decarbonise the power sector by 2050 and meet our CO₂ reduction targets. While renewable energy can reduce our dependence on fossil fuels we also believe it will create thousands of business and employment opportunities, developing cutting-edge, innovative green-collar industries. We are committed to ensuring that as many of these benefits and jobs are created here in the United Kingdom. Thank you.

Q473 Chairman: Thank you very much. Perhaps I could open the questions and ask you, would not a more robust and higher carbon price remove the need for the cumbersome support mechanisms that currently exist for renewable energy? That would be the route, I suppose, of least intervention by the Government in the market and, by extension, would give the greatest opportunity for the market to respond in an efficient way in reducing CO₂ emissions.

Malcolm Wicks: We do not believe that they are alternatives; we think they are complementary. Certainly, we are supporters of the European Union's Emissions Trading Scheme and we are ambitious about its development, not least in phase 3. Even if you look ahead to phase 3, people are projecting a price for a tonne of carbon at, say, about €35, whereas probably to develop renewables alone through this mechanism might require a carbon price of somewhere between €100 to €200. We feel that, in addition to the ETS, the carbon price mechanism, we do need to support renewables in other ways, and principally, of course, through the development of our existing renewables obligation.

Q474 Chairman: Do you think, therefore, if there is a substantial gap between the prospective carbon price under the trading system and what would be required to encourage renewables to the pace that you would wish, that is a failure somehow in the mechanism of the trading system?

Malcolm Wicks: I think the trading system, the ETS, is still a fairly new creature, and certainly in the early phase, or so, it was very much trying to move forward – sometimes tumbling over, sometimes staggering. However, I think as we see the development towards phase 3 we start to see the development of a more robust mechanism where there will be a significant amount of optioning, for example, and as the price increases we can start to build into it aviation, which is very important. I hope it will become a means of helping but not fully supporting carbon capture and storage as well as renewable technologies. So carbon

trading is very, very important but, to repeat the point, we do not feel that for the foreseeable future it will help fully fund renewables; we do need other mechanisms.

Q475 Chairman: I guess, if the difference between the prices is not a measure of the weakness of the trading system then it certainly indicates that renewables will be a very high cost means of achieving reductions in CO₂ emissions.

Malcolm Wicks: Yes, and I said in my opening statement that there are significant costs attached. Although the different technologies have different histories and some are better developed than others, they are new technologies still and, like any new technology, they are relatively expensive. Over time we would hope that the unit costs would come down. I think that is not an unreasonable expectation: if you look forward to, say, the costs of photovoltaics, we will see quite a steep decline in price. I cannot quite predict when but when you see the extra manufacturing coming on in places like China, at the moment, of course, PV (photovoltaics) are really expensive. We are reforming the renewables obligation through the Energy Bill, which is now before your House – it has been in the Commons – so that it can become a rather more sophisticated instrument, more sensitive, to the costs of some of the newer renewable technologies. So we will be supporting offshore wind more than onshore wind; we will be supporting even more the marine technologies of tidal and wave.

Q476 Lord MacDonald of Tradeston: Nuclear power cuts carbon emissions without the intermittency problems of renewables, and recently Sir David King argued that nuclear power should account for 40 per cent of maximum electricity demand. What is your view?

Malcolm Wicks: My view is that diversity should be the name of the game when it comes to our energy strategy and our strategy for tackling global warming. This Government has been through a process of, first, deciding whether or not civil nuclear power should have a role to play going into the future. We decided, following the Energy Review, that the answer to that

question should be yes, that we would authorise the private sector to come forward with proposals for new nuclear reactors. We need a suite of policies. Not that you were saying so, my Lord, but I know that some would like to see this as a battle, a tussle, between renewables on one side and nuclear on the other. I think that is a naïve analysis. We need a range of things, both for the nation's energy security and to tackle global warming. I would not put a percentage on nuclear; at the moment, about a fifth of our electricity (probably 18 or 19 per cent) comes from nuclear. Those reactors are old, they will need to be decommissioned and we probably will not see the first nuclear reactor built in this country and operational until 2018, probably, being optimistic (some might say more realistically 2020). I personally would hope we would then get a significant proportion of our electricity from nuclear, for the reasons that you gave: that it is clean and green and it helps us in terms of our energy security. However I think it is difficult to put a proportion on that.

Q477 Lord Turner of Ecchinswell: Can I ask a follow-up to that? Would you have any concerns if nuclear did grow as Sir David King has suggested to 40 per cent – i.e. if, over the next 20 years, pre-market operators bring forward proposals that would take it to 40 per cent of our electricity? Do you think there is any reason why there should be a policy concern about that, or is that a completely acceptable result, if it was to occur?

Malcolm Wicks: I think it is perfectly acceptable, should it occur. I am just trying to think whether I need to qualify that in any technical way. My colleagues might want to come in on that. I do not think so. As I say, we do not set a target, we do not set a proportion, we do not talk about the number of nuclear reactors that should be built, but I think for reasons of climate science and energy security a significant proportion coming from nuclear alongside the renewables would be very, very important. I should say to this Committee that I worry greatly about climate change and global warming, although I think, with one or two exceptions, we are winning the argument on that one - with one or two important exceptions I

think we are winning the argument on that one - but I worry more about energy security and national security. When you look around the world at where the energy resources are concentrated, they are not always in places best associated with human rights and democracy, and the more energy we can produce for ourselves in a troubled world, I think, the better. The only thing, if I may add, is that I think that, both for reasons of diversity but, also, for the operation of the Grid and the network, we also need fossil fuel generation to give us the flexibility; it can come on stream faster, as I understand it, than nuclear, and therefore we will need fossil fuel power stations - hopefully, as soon as possible, with CCS

Q478 Lord Lawson of Blaby: As a follow-up to my Lord the Lord Chairman's question, and on the little sort of aside that the Minister made, I would make another aside that I think it is a matter, on your side, of assertion rather than argument, and that is not what we are about in this Committee.

Malcolm Wicks: No.

Q479 Lord Lawson of Blaby: What we are about in this Committee is seeing what the economics of renewable energy are and, also, how they compare with the needs of achieving the objectives that the Government has stated. I am slightly puzzled: you say you are even-handed as between nuclear and renewables. That is the impression you gave. However, in fact, in your own written evidence you have said that the costs of generating electricity from renewables are, in general, currently higher than their conventional fossil fuel and nuclear counterparts. In other words, you say very clearly that nuclear, in your opinion, is cheaper. So that might suggest that it is sensible because (we are a wealthy economy but not all that wealthy) we will be looking to find the best buy. So if you did have a bias it should be in favour of nuclear, but, in fact, you have a pronounced bias in favour of renewables. The support for renewables (and you say in your written evidence that you are going to need

further support) is far greater than the support for nuclear, which I suppose, to some extent will include – I do not know what it will be – the disposal of nuclear waste, or storage. Anyhow, it is far higher for renewables, which does not seem to me to be even-handed at all. What is the reason for that?

Malcolm Wicks: I must check the record but I do not think I used the term “even-handed”. I hope the impression I was giving earlier on was that I did not see this as some kind of battle and contest between renewables in one corner and nukes in the other corner; I think we need both, for different reasons, which I have touched on. I understand what you are saying, Lord Lawson, because it certainly is the case that whereas we have made it clear that public spending will not subsidise or support in any way nuclear going forward, we are in different ways, partly through public spending on R&D and partly by the provision of the renewables obligation, subsidising renewables. I think the reason we are doing that is these are a range of relatively new technologies. Like many technologies, they need support in the early stages of their history. So you are right to point out that in that financial sense we are not being even-handed; we are giving more support to renewables compared to nuclear, which we are not directly supporting at all.

Q480 Lord Kingsdown: Just a short question. I thought you said, Minister, that it would be 2020 before any new nuclear plants were in operation. If that is right, does it really take 12 years to get a new nuclear plant going?

Malcolm Wicks: Probably, yes. The most optimistic scenario I have seen is that there possibly could be one up and running by 2017 and then some others talk about 2018. I guess I am just being a little bit more cautious when I said 2020. We are now going through, really, quite a complicated process; the Energy Bill is still going through Parliament and the Planning Bill is still going through Parliament (with some controversy, I understand) and that is part of the structuring that we need to develop. There will be environmental assessments to

look at appropriate sites for new nuclear, and there will be a National Policy Statement, should the Planning Bill achieve Royal Assent – so there is a quite a process here. Meanwhile, we are being very active; we have asked the appropriate agencies, the nuclear inspectors, the Health and Safety Executive and other bodies to do what we call a generic assessment to look at a short-list now, I think, of four technologies – four possible nuclear reactors – which are being developed in different parts of the world to see whether they are fit for purpose in terms of UK requirements. So a great deal of work is going on, but that will take some years and then perhaps it takes four years to build a nuclear reactor, which is why I am being cautious (but I do not think too cautious) in suggesting that the first one will not be up and running until well by the end of the next decade.

Q481 Lord Turner of Ecchinswell: Tempted as I am to make an aside on Lord Lawson's aside on the Minister's aside, I will avoid that and move to the third question, which relates to the other thing which Sir David King (who I do not think could be accused of being unbiased between renewables and nuclear) said last week, which was that he believes there is a problem in going above, say, 20 per cent reliance on wind because of intermittency. Clearly, if we go to 30 or 35 per cent from renewables we will probably be going above 20 per cent in wind, maybe to 25 per cent. At what level do you think intermittency problems become seriously large, or do you believe that it is simply a matter of the cost of back-up, and what do you think is the rough cost of that back-up?

Malcolm Wicks: Let me speak briefly, and then I will ask my colleague, Tera Allas, to come in on this. If it is confirmed that our target as part of the wider European target is that 15 per cent of all energy (of course, it is not just electricity it is all energy) should come from renewables by 2020, then given the need for some real caution about renewables and motor cars – where the current concerns are about biofuels – a significant effort needs to be made in terms of renewable electricity. We are talking in terms of, maybe, 30 to 35 per cent of our

electricity by the end of the next decade, 2020, coming from renewables. All the advice we receive is that that is possible - the National Grid can be run that way. The National Grid itself is doing a great deal of work looking forward to see what a grid would look like. The challenge is to the Grid, with a significant proportion from renewables and then, after that, perhaps, a growing proportion from nuclear. So a great deal of technical work is being undertaken. So although I have learnt a great deal from David King when he was the Government's Chief Scientist, I do not agree with his analysis of this one. Tera, would you like to come in?

Ms Allas: I will, perhaps, just go into some more detail. That is basically our understanding and all the engineers, consultants and other groups of people we have spoken to suggest that there is not any technical reason why you could not have very significantly more wind on the system. So even at penetrations of 30-35 per cent, technically, the system should be able to operate. You would need changes to the system in the form of faster response, or more fast response, utilised more often when the wind speeds change unpredictably, and that would incur some costs. The kind of costs that have been estimated by SKL (a consultancy for us) in that scenario of 30-35 per cent renewable electricity in 2020 are, roughly speaking, £4 per megawatt hour of the kind of short-term system balancing costs for each unit of electricity in 2020, and then further costs of enabling the back-up that needs to, basically, stand aside in order to kick in when the wind is not blowing, of roughly £0.8 per megawatt hour - so adding up to, in total, roughly, £5 per megawatt hour of electricity.

Q482 Lord Turner of Ecchinswell: Which would be about a half-a-pence per kilowatt hour - just so that we can relate it to a retail electricity price of 10p or 11p per kilowatt hour.

Ms Allas: Yes.

Lord Turner of Ecchinswell: So £5 per megawatt hour, just for clarification, is half-a-pence per kilowatt hour.

Q483 Lord Lawson of Blaby: Could I ask one specific question? What do you regard as the capacity credit of wind power?

Ms Allas: There are various different analyses. Our analysis suggests that it, first of all, depends on the penetration of wind; it depends on the penetration of other renewables on the systems – so intermittent renewables from, let us say, marine – but, broadly speaking, the estimates we have seen are between 10 and 20 per cent capacity credit, which of course is not the same as the amount of electricity that that wind farm will be generating, which is the volt factor, which is more like 30 or 40 per cent.

Q484 Lord Lawson of Blaby: That is an unusually optimistic estimate. The value used to run the Danish power (?) said it is approximately 0, and most people think it is around 5 per cent.

Ms Allas: It obviously depends on how you define capacity credit. The way we have decided to define it is so you can compare apples to apples. In other words, what is the contribution of wind to security of supply, and in order for you to maintain exactly the same level of security of supply how much can you rely on the wind to blow is a probabilistic concept. The nukes are not there 100 per cent of the time either, the gas-fired power stations are not there 100 per cent of the time either, so you have to take into account the average availability and the distribution of the availability, and its correlation with demand. If you take all those things into account, then the probabilistic calculation gives you roughly 10 to 20 per cent, but it does depend on what you assume about the distribution of wind. Obviously, wind does not blow every hour of the year; the more distributed it is across the country the more it will be available, and there are very few hours when there is no wind at all across the UK.

Q485 Baroness Hamwee: You mentioned the need for fossil fuel generation to back-up renewables. How much? Secondly, are new nuclear plants flexible enough to provide back-

up to renewable generators? I take it that is part of the assessment that you are carrying out at the moment, but perhaps you could just amplify on that.

Malcolm Wicks: Yes, I think so. I am loath to answer the “how much” question, partly because I do not know and partly because for good or ill – I think broadly for good – we are no longer in the era of national planning, where a minister of power sits in a chair and writes out percentages or figures. I have said earlier that looking forward, as it were, nuclear becomes more and more important, but after 2020; renewables will have become very important by 2020. However, I think, partly for reasons of just security and diversity, we also need fossil fuels, and partly because it helps the system operate *in extremis*. It is easier to bring electricity into the Grid from a gas-fired power station or a coal power station, so I understand, than it is to turn up the switch, as it were, which is not easy with nuclear power or from renewables. It is very interesting that two winters ago, when we faced some quite serious difficulty because the Langeled pipeline had not come on tap from Norway and we were facing quite a tight winter, with gas prices rising very high at one stage in that winter for several months, I think, some 50 per cent of our electricity was from coal, whereas it is normally about one-third, I believe.

Q486 Baroness Hamwee: Forgive me, I do not mean this as impertinently as it is going to come out ----

Malcolm Wicks: Do not worry.

Q487 Baroness Hamwee: ---- national planning or not, you are going to have done internal calculations, and are you not going to have to share those in order to take the public with you along what are controversial routes, whether one is in favour, on the one hand, of renewables above all, or, on the other, nuclear?

Malcolm Wicks: My colleague Simon Virley will come in but what I was implying was that although, obviously, for certain work you need to make certain assumptions, I do not think, in a competitive energy market, it is sensible for government to prescribe the number of gigawatts from this source or that source, or the precise amount of nuclear energy. Simon, do you want to come in?

Mr Virley: Just to say that we have published some scenarios in our consultation document, and one of the scenarios that we have illustrated in here, which is a scenario with 32 per cent of electricity coming from renewable energy, the sort of additional plant you need on the system is about 30 gigawatts of additional renewable capacity coming on by 2020 relative to 2008, and about 17 of additional conventional plant. That is just one of the scenarios that we have illustrated in the consultation document. As the Minister says, these are scenarios based on a host of assumptions: change the assumptions and you will get a different result.

Q488 Chairman: Can I ask a follow-up question on this? The fossil fuel generators which are needed as a back-up to renewables will run at a lower than normal percentage of capacity, and that implies that there will be an increase in carbon emissions per unit of electricity. That is the nature of the engineering, we are told. Could you let us know what would be the net impact on carbon emissions taking account of the use of that back-up capacity, assuming that we are at about 30-35 per cent renewable-generating electricity?

Mr Virley: I can give you that figure. The net saving from the scenario that you have illustrated is about an additional 20 million tonnes of carbon dioxide in 2020. That is outside of the sectors that are already capped by the Emissions Trading Scheme. That is the net impact of the scenario of 35 per cent renewable electricity that has been modelled in our renewables consultation.

Malcolm Wicks: May I just add to that that. Much depends on the development of carbon capture and storage or sequestration technology. It is difficult to predict that but the UK is a

leading nation in CCS. We will have our demonstration project hopefully demonstrating the technology by 2014, something of that order, and what one would like to think is that during the course of the next decade we will see CCS being demonstrated and becoming more universalised as a technology, and if that turns out to be the case, as I would hope and expect, then it affects the scenarios about CO₂ emissions.

Chairman: I think we will come back to carbon capture a little later. Lord Layard?

Q489 Lord Layard: This is pursuing the same point that we have been discussing about the overall wholesale cost of electricity. In your consultation document you suggest that that would fall with renewable generators replacing the more expensive conventional ones. How is that consistent with this problem of having to keep the conventional ones going because of intermittent output?

Malcolm Wicks: May I turn to my chief economist.

Ms Allas: First of all, we need to separate price and cost. I was not sure if I heard you correctly.

Q490 Lord Layard: I corrected myself.

Ms Allas: I probably misheard you but what will go down is the wholesale price of electricity. As we discussed earlier, costs in terms of the electricity system would have to be higher because we are implementing some of the higher cost renewables, but putting that aside, the lower price of wholesale electricity is a result of having more renewables pushing out some of the higher cost fossil fuel plants in the short term. How that is consistent with there still being quite a lot of fossil plant on the system is because the fossil plant will kick in exactly in the hours when the wind is not blowing, which is exactly the hours in which prices will be much higher than that average, so even though the time-weighted average price will come down, there will be maybe five or ten per cent of hours in the year when prices are very significantly

higher than average and they will be sufficiently high to remunerate the very low load factor plants with the sustainable system, so if you look at the hours in which the low load factor plant is generating, they actually make quite a lot of money from those few hours.

Q491 Lord Griffiths of Fforestfach: The document just referred to by my colleague Lord Layard says that the Government is committed to the EU proposal of 15 per cent of energy from renewables by 2020 and then it makes a very strong statement for a Government document and says it is a 'very challenging target'. The question is: are you really committed to this? If you are committed to it and you find as we approach 2020 that this target is not going to be met, does that mean that you will be increasing your subsidy for example to the renewables sector? If I were a producer in that sector and I thought I might switch from what I am doing and go into renewables, what could you tell me which would ensure that this would be a profitable investment, because it is a highly uncertain situation?

Malcolm Wicks: First of all, I hope that strong statements and Government documents are not always strangers!

Q492 Lord Griffiths of Fforestfach: There have been many failures along the way!

Malcolm Wicks: I think we are just talking in plain English; it is hugely challenging. These are not weasel words. We are committed to achieving this target, but to show the scale of the challenge, we are talking about percentages of all energy, at the moment probably 1.5 per cent of all energy is coming from renewables in this country. It is now about five per cent of our electricity but only 1.5 of all energy, so it is obviously a ten-fold increase that we need to achieve, so, yes, it is very challenging. We have set out in our Renewable Energy Strategy Consultation published a week or so back how we hope to move in that direction. We do need to have regard to cost-effectiveness because I am very conscious that at the moment at the top of the agenda in terms of energy concerns is the sheer price of energy, and certainly

gas and electricity in the home, so we need to be sensible about this, which is why we are in favour of some trading within the European Union on these issues because our analysis suggests that the last one percentage point, as it were, of renewable energy would probably be the most expensive point to achieve, and if through some sensible trading within the EU we can bring that cost down then on behalf of the consumer we should do that.

Q493 Chairman: Leaving the trading to one side just for a moment, just as a matter of fact, at the European level has the decision been taken that our target should be 15 per cent? Put slightly differently, if the Government were not committed to it, is there still any scope for renegotiation?

Malcolm Wicks: It is still being discussed and I think we will know for certain by next spring, and so there is discussion going on, but the Commission have produced draft targets for Member States and all Member States are now looking at the implications. We have published our document and the discussion still goes on, but it is going to be there or thereabouts.

Q494 Lord Best: You have picked up on the point, Minister, that one extra per cent from 14 to 15 is extremely expensive and you have explained how it may be possible to negotiate around that, but is the 15 per cent target only really possible if British funding of renewable energy projects overseas can count towards the target?

Malcolm Wicks: I think it is possible to hit the target without that. The idea that there could be some extra European development and funding as part of a trading mechanism is something that is being discussed. It is not clear yet what the final European judgment will be on that.

Q495 Lord Kingsdown: But Lord Best just made the point that going to 15 per cent is far more expensive than going to 14 per cent. Is this not an argument for negotiating a slightly lower target or is that not done?

Malcolm Wicks: I think it is an argument for looking at sensible ways of hitting the target. I do not myself think it is an argument for saying let us try to go for ten per cent, but the idea of trading is perfectly sensible. It is something we have looked at. We have also suggested in the past that because we are ahead of other European Union nations (Norway is where we are I think) in developing carbon capture and storage, we have said to the Commission could this not somehow be allowed for in the setting of our target, not because CCS is renewable because it is not but because this is another expensive technology, so there has been some discussion on that as well.

Q496 Lord MacGregor of Pulham Market: I would like to turn to biofuels and ask you a number of questions about that. As you know, the recent Gallagher Review called for biofuels to be introduced more slowly because of uncertainties, one of them being the estimated recent effects on food prices, and others as well, and the Government seems to have accepted that target of introducing it more slowly. The review also warned that current policies might increase rather than cut greenhouse gases not least because of the implications on forests. I am not talking about the UK but in Brazil, et cetera. I would be interested to know your view about that as to whether you agree that current policies on biofuels might increase rather than cut greenhouse gases? Then the question of timing: does this derail your plans for ten per cent of fuel to come from renewables if we are becoming more cautious about biofuels, and also your hopes of reaching the EU's overall renewables target by 2020?

Malcolm Wicks: I do not think it undermines our efforts to hit those targets, but clearly we are all learning a great deal about biofuels and, as you have said, what we have learned is partly about the law of unintended consequences. We have learned that there is absolutely no

point in, as it were, appeasing Western consciences on climate change and on renewables if it leads to terrible consequences in terms of food crops, so I think all of us in this debate are pausing for thought and reassessing, and the Gallagher Review has helped us do that, but perhaps Simon Virley could add to my general comments.

Mr Virley: In essence, we are slowing down on biofuels to make sure that we are reviewing the evidence to make sure that we have got the right sustainability criteria in place to ensure we bring through the right biofuels, biofuels that will reduce greenhouse gas emissions rather than increase them, and that science is evolving rapidly all the time. What the Gallagher Report has said is that ten per cent by 2020 might still be possible but it would only be possible subject to those stringent sustainability criteria being in place, so that is the basis on which we are moving forward now.

Q497 Lord MacGregor of Pulham Market: Can I ask a supplementary and perhaps declare a form of interest in that I was a former Director of Associated British Foods which has got the British Sugar biofuels plant. In terms of greenhouse gases and feasibility and the law of unintended consequences, we are really talking about imported biofuels by and large because the effects are actually in the United States and Latin America rather than here where the aspect of alternative land use and food crops does not really apply. I imagine that is the case and it is the import of biofuels that is the main concern.

Mr Virley: It is and obviously we need to also look at the full carbon cycle of the biofuels that are being produced, including the transportation element, so in a sense moving forward on this we need to get the sustainability criteria in place and the controls in place to ensure that we are using the right kind of land and making sure that we are using the right biofuels that are actually reducing greenhouse gas emissions and that is the evidence that we are trying to pull together now.

Q498 Lord Lawson of Blaby: Minister, you said that you were very concerned about cost-effectiveness because you were concerned about the burden on the consumer which is going to be a huge burden for them and we can already see that. We have already established that as far as nuclear is concerned, the cost-effectiveness yardstick really goes out of the window, but you have focused particularly on using trading to increase cost-effectiveness. I would like, if I may, to ask you two questions on that front which really are closely related. One comes from the excellent written evidence which your Department has given us, where you say, and I will remind you: “Without effective and workable trading provisions which allow for a more efficient use of renewable resources across Europe, it will not be possible to meet the 20 per cent EU target cost-effectively. Independent research carried out by Poyry Consultants for the UK suggests that full and open trading could save the EU up to €7 billion a year in 2020, chiming with the Commission’s own impact assessment - although this is unlikely to materialise.” My first question is why is it unlikely to materialise? The second question is this: clause 25 of the Climate Change Bill lays down that “the Secretary of State must ensure that at least 70 per cent of the effort undertaken for compliance with section 5(1) is achieved by domestic emissions reductions ...” In other words, there is a maximum of 30 per cent that can be done by trading, even if 40 per cent or 50 per cent would be much more cost-effective, so why do you have that clause?

Malcolm Wicks: I think when looking at this you need to judge it against a number of criteria and one which we would emphasise is cost-effectiveness. Another one - and I touched on this earlier - is about energy security. I think we need to do our best in the future to get the balance right. We can argue what the right balance is between the energy that we will need to import into our nation as our own reserves of oil and gas in the North Sea and wider UKCS decline and getting the balance right between imports and what I would simply call home-grown energy. I do feel myself that the more energy we can produce in this country as a

safeguard for the nation is very sensible. Therefore if it was theoretically sensible to build all the renewables in Asia or Africa, I do not think that would help us in terms of our energy security. The other thing is a commonsense test. I think when people see a British target they would not be terribly convinced if we hit most of that target by doing things abroad. I think it is sensible that we do most of it here in Britain.

Q499 Lord Lawson of Blaby: I do not think that really answers the question, if I may say so. It does not answer the question as to why in your written evidence you say that the increased cost-effectiveness through trading is unlikely to materialise. Also I would say that the trading does not in any way diminish our energy security. In fact, if it did, we would not want to do as much as that, but I do not think it does and I do not see how it does.

Malcolm Wicks: I suppose I am just working on an assumption that a wind farm here in Britain *in extremis* is more likely to be secure than a wind farm on some corner of Europe. That is what I was getting at. Let me ask my colleague Tera Allas to comment on the other point you raised.

Ms Allas: On the question about why the benefits of trading are unlikely to materialise, it should say unlikely to materialise “in full” so the €7 billion that has been estimated per annum savings is a theoretical number, assuming perfect competition, assuming a perfectly liquid trading mechanism, and assuming essentially least cost meeting of the EU’s overall target across 27 Member States. Obviously it is underpinned by some assumptions about costs and resource in each of those countries. In reality, the kind of trading mechanisms that are being negotiated within the scope of the EU Directive are not going to be those kinds of fully liquid and totally competitive and entirely transparent mechanisms and indeed, even if they were, there are no markets that are totally perfect competition in this world, so it is a kind of theoretical number. We would expect that with a good trading system, which still was within

the scope of the Directive you could probably get most of it, but you will never get the full theoretical benefits of competition in any market.

Lord Turner of Ecchinswell: Could I clarify something in what Lord Lawson said. I think I am right in saying that the amendment to which Lord Lawson refers is an amendment not in the Bill ---

Lord Lawson of Blaby: Yes it is; I have got it here. I think Lord Turner ought to know the Bill since he is Chairman of the Climate Change Commission Committee!

Lord Turner of Ecchinswell: My understanding was that the issue of how much we should rely ---

Lord Lawson of Blaby: I will read it out. It is section 25 and it is headed “UK Domestic Effort” and subsection (1) says: “The Secretary of State must ensure that at least 70 per cent of the effort undertaken for compliance with section 5(1) is achieved through domestic emissions reductions and domestic removal of sinks.” This is in the Bill.

Q500 Chairman: I think I must bring us back to asking questions of our witnesses and perhaps I can lead the way by asking you a bit about renewable heat. A number of witnesses have suggested to us that heat is something of a poor cousin amongst renewables and not enough attention has been paid to it. What would be the best way to boost the amount of renewable heat? Would it be to bring fuel used in heating into the European Emissions Trading Scheme or to create one of the schemes described in your consultation paper, perhaps a renewable heat incentive or indeed a renewable heat obligation?

Malcolm Wicks: May I say that I think there is an even wider issue about heat. Many people feel, as you have said, that it has been a poor relation, the Cinderella that has never been invited to the ball, and it is not just about renewable heat, there is a lot of concern in terms of power generation where we waste the heat. There is a lot of new interest therefore (it is an old idea) in combined heat and power. We asked the Office of Climate Change to do a

review in terms of heat strategy and they have produced their report and now in terms of renewables in our Renewable Energy Strategy Consultation document we have discussed the issue. We want to see a debate and we want to see new evidence on this. The consultation document favours tentatively a renewable heat incentive over an obligation, so we are now looking at mechanisms to encourage renewable heat, but my colleague Simon Virley can add to my remarks.

Mr Virley: As the Minister says, we see renewable heat as being a big part of helping meet these targets. The issue we see with bringing heat into the EU ETS is essentially one that it will not provide, as we were describing earlier, a sufficient price incentive for the take-up of these new technologies, and therefore we have looked at more dedicated support mechanisms to try and incentivise the take-up by households and businesses of renewable heating. We are favouring tentatively a consultation document on a renewable heat incentive primarily because of the difficulties of imposing an obligation-style system on such a fragmented market with a large number of suppliers, so an incentive mechanism would essentially be a subsidy for those new heat technologies, whether it is ground source heat pumps, biomass boilers, and that subsidy will be paid for by a levy on fossil fuels used for heating elsewhere. That is what we are proposing but obviously we are now looking for views as to whether in fact that is the best mechanism going forward to incentivise a step change in renewable heat.

Q501 Chairman: Do you think there are any other countries in Europe that have got heat right in terms of incentives and obligations?

Mr Virley: The truth is that heat has been a Cinderella in most countries and most countries are only now starting to think about the policy frameworks that they need to put in place to incentivise both low carbon and renewable sources of heat. Whilst a number of countries have different configurations of gas grids and so on, which gives them different policy questions, the truth is that not many countries have moved in the direction of producing

discrete and significant incentives for heat technologies. Germany is one country that is starting to move in recent months in that direction but there are very few others that have done so to date.

Q502 Chairman: Not even heat and power together?

Mr Virley: Combined heat and power has received incentives in some countries, yes, but obviously most combined heat and power is still gas-fired and therefore not renewable, so whilst we are keen to incentivise all forms of low-carbon technology, for the purposes of meeting this target of course we would need to focus on renewable sources of combined heat and power of which there are some, and that is what our renewable heat incentive would act to do.

Malcolm Wicks: Copenhagen is an interesting example of combined heat and power on a major scale. There is a power station there producing a lot of heat for thousands of homes in Copenhagen and retail too but it is co-firing; they actually have great bales of straw going as well as coal and it is not all renewable, so in different parts of Europe there is interesting practice.

Q503 Lord Macdonald of Tradeston: Your consultation paper shows that the unit cost of electricity micro-generation is roughly double that of other renewable energy so why are you considering policies to support micro-generation when it is such a high-cost option?

Malcolm Wicks: I understand the question and I think given the economics of the moment, if we were just focusing on the economics, we probably would not want to look seriously at micro-generation, but I think there are other issues. Personally I feel strongly that if we are to hit our climate change targets, if we are to reduce CO₂ by this enormous amount, then this should not just be a matter for big institutions and the G8 or the EU and government and big organisations. I think many citizens are concerned about climate change and many citizens

are concerned about waste more generally and many concerned citizens are asking how they can personally make a difference. They are the recycling generation, as it were, who are now thinking about their own dwellings and are interested in micro-generation. Much of it is still a very expensive technology and if in suitable ways we can enable people to become micro-generators, build some renewables into their dwellings, I think that hits the button in terms of active citizenship even if it does not pass a pure economic test.

Q504 Lord Turner of Ecchinswell: Can I ask how you see the role of renewable energy relative to other ways that we could reduce carbon emissions, for instance by demand reduction energy efficiency but also how you see the potential for carbon capture and storage and when you might anticipate that that will be available?

Malcolm Wicks: That is a question that could lead on to an attempt to outline a comprehensive energy strategy and we have written the book and you have seen it, sir, so I do not need to do that. I do think any sensible energy policy and any sensible climate policy starts with trying to reduce energy demand, certainly in economies like the United Kingdom, and therefore energy efficiency needs to be given a far higher priority, whether that is about technology, whether it is about the development of new engines for our motor cars which use fuel more efficiently, or whether it is about how we can start to think about retrofitting the existing housing stock with insulation and maybe renewables in a more ambitious way than we have done hitherto. I would start with energy demand and trying to reduce it and therefore I would start with energy efficiency and then after that you get on to the things we have discussed and, in no particular order, you get on to the development of renewables, you get on to the development of a new generation of nuclear reactors, and you certainly get on to clean coal technology and CCS.

Q505 Lord Layard: As a sort of follow-up I wanted to ask how you see the role of basic research and development in tackling the problem of climate change. This is a fairly recent challenge and I wonder if you think that enough money is going into the basic research and development which may find solutions which we have not even been discussing today? There must be huge public good issues involved here. Whoever does this, a firm cannot be sure of trapping the returns to a basic discovery that it might make. Are you satisfied with the international effort? Do you feel that the world of science and technology has given sufficient priority to the climate change challenge and do you think our community is doing enough and getting enough support for doing it?

Malcolm Wicks: I guess you could always argue about what we mean by ‘sufficient’, but I think I am confident that worldwide and certainly here in the United Kingdom, a great deal of extra resource is now being brought to bear on this issue. Internationally the International Energy Agency are doing very important work. They have produced a technology handbook which compares and contrasts the economics of different technologies. I think that is an excellent piece of work. I am impressed that you go around many parts of the world and there is huge development in some of these technologies. Recent announcements on CCS in Canada come to mind for example. Here at home we have established the Energy Technology Institute which is now up and running. It is public/private sector and many major companies have subscribed. We are still looking for one or two other subscribers. The idea is to have a budget of £1 billion over a ten-year period to invest in energy technologies. You have also got now part of our sister department DIUS the Technology Strategy Board, which is funding developments in energy. I think they have done some recent support for wind turbine technology, for example, because we should not assume that the kind of turbines we need in the future offshore are exact replicas of what we have onshore, to put it in rather over-simple terms. We have a fund of money ready to fund the deployment of marine technologies

and so on. There is the Energy Transformation Fund that we also have. We have set these out somewhere and I will make sure, my Lord, that you see the documentation. The research councils too of course are very active and we are beginning to see new developments in university departments. There is certainly new interest in nuclear science for example in our universities.

Q506 Lord Lawson of Blaby: A brief parting shot on carbon capture and storage which Lord Turner asked you about. Obviously we do not have the faintest idea at the present time of what it will cost but, leaving that aside, more fundamentally one of your predecessors in Energy, Mr Alistair Darling, told the House of Commons last year that the technology needed for carbon capture and storage might never become available. That is what he said to the House of Commons, presumably on advice from your excellent officials. Is that still the position? If not, can you explain to us what has happened over the past year that has changed it?

Malcolm Wicks: I come from further south in the country and therefore by temperament I am more - I have to choose my words carefully - optimistic about this technology. Whether that is the passing of a year ---

Q507 Lord Lawson of Blaby: Or wishful thinking, whatever you like?

Malcolm Wicks: No, I really do not think so. I think what Alistair Darling was reminding the House is that this is a new science, a new technology, new engineering and at scale has never been tested. Of course what we are doing in the United Kingdom is to fund this. You talked about the cost and it is expensive and will cost hundreds of millions of pounds for one demonstration project. We want to test CCS with a coal power station, stripping out the CO₂, transporting it and successfully storing it almost certainly in a depleted oil or gas reservoir under the North Sea. No-one has tested that yet, but this is not, however, science or

technology fiction because, as you know, sir, around the world there are different practical examples of different aspects of the CCS cycle. The Norwegians have demonstrated in the Sleipner field that you can return CO₂ successfully to a depleted reservoir. They have been doing that now for a dozen years and geologically it is behaving as one would expect, which I think in plain English means it is still there. I have seen in Mississippi myself the use of CO₂ to inject into oil reservoirs for enhanced oil recovery and so on. There are a number of practical examples of this but, as yet, not the full demonstration. I think I would be as confident as a mere social scientist can be that the technology will work.

Q508 Chairman: Thank you very much indeed, Minister, to you and your colleagues for spending so much time with us this afternoon in answering our questions. Although our report when it comes out will not be a direct response to your consultative document, I hope it will be a useful contribution in your consultative process.

Malcolm Wicks: Thank you very much indeed.