House of Commons

Energy and Climate Change Committee

Project Discovery

Oral Evidence

2 December 2009 and 24 February 2010

Mr Alistair Buchanan, Chief Executive, Mr Ian Marlee, Partner, Trading Arrangements, and Mr Andrew Wright, Senior Partner, Markets, Ofgem.

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Oral evidence

Taken before the Energy and Climate Change Committee

on Wednesday 2 December 2009

Members present

Colin Challen	Sir Robert Smith
Charles Hendry	Paddy Tipping
Miss Julie Kirkbride	Dr Desmond Turner
Judy Mallaber	Mr Mike Weir
John Robertson	Dr Alan Whitehead

In the absence of the Chairman, Paddy Tipping took the Chair

Witnesses: **Mr Alistair Buchanan**, Chief Executive, **Mr Ian Marlee**, Partner, Trading Arrangements, and **Mr Andrew Wright**, Senior Partner, Markets, Ofgem, gave evidence.

Q1 Paddy Tipping: Mr Buchanan, welcome again to the Select Committee. You need no introduction, but it would be helpful for the Committee if you could introduce your colleagues.
Mr Buchanan: Yes, I am joined today by my Senior Partner, Andrew Wright, who is Senior Partner in charge of markets, and Ian Marlee is a Partner in the Markets Division with specific responsibility for Project Discovery.

Q2 Paddy Tipping: Can you tell us, what does "partner" mean? It sounds very professional.
Mr Buchanan: Well, I hope it does send a message of being very professional. When we created our two business structures at the beginning of September this year, E-Serve, which is very much more like an ordinary business, it manages the delivery products primarily of the Government, we felt that the titles in that organisation should be like a business, so director, managing director, whereas we have stolen from Ofcom their idea of partnership to create a greater collegiality within the regulatory policy work which is where Andrew and Ian both sit.

Q3 Paddy Tipping: So tell us about Project Discovery and particularly the bit that caught the headlines that prices could go up by 60 per cent. Having read the report, which talks about a lot of investment in the future, the potential of a shortage of supply and switch-off and high prices for consumers, it is a pretty bleak picture. Can you reassure us a bit?
Mr Buchanan: The reassurance, I think, comes with, in a way, the bluntness and the directness of the message. The good news, as we have outlined in the initial report which we published in October, is that there will be substantial carbon reduction under all our scenarios. The bad news is that there is investment required possibly up to £200 billion and prices will go up under the four scenarios possibly by 2020 by as much as 25 per cent. Candidly, we are not trying to hedge that factor on consumer bills. What we will do, and I am sure we are going to talk about it in regards to how we are monitoring prices this winter, and what is incumbent upon us is to make sure that the companies do not take advantage of an environment where there is a knowledge that a large amount of investment needs to be made and, therefore, prices are reacting to that investment message, and we have to make sure that they do not take advantage of that. It is absolutely critical on us and, frankly, it is shameful of any company to take advantage of that overall picture.

Q4 Paddy Tipping: But £200 billion is an awful lot of money and the market is very difficult at the moment. Are you confident that this investment is going to come forward?
Mr Buchanan: I think it is a very direct and relevant question, Chair, because, in looking at the investment needs of the energy and climate change area, we need to look at a number of issues with regard to capital. First of all, we need to look at the players who provide the capital from the capital markets. Unlike five or six years ago, the major energy players in this country at the moment have serious capital constraints. If you look at four of the six of the big six which are European, EDF and E.ON have announced substantial capital restrictions and their balance sheets are full. Both companies have indicated that they are looking at their assets with regard to sales in order to ease pressure on their balance sheets, so you have seen stories about EDF looking to sell some of its network companies in the UK. Perhaps of greater concern to this Committee, looking at security of supply, is that E.ON have put a freeze on developing three of their power stations in the UK, that is Drakelow, High Marnham and Kingsnorth, so there is substantial pressure on capital. Iberdrola, who owns Scottish Power, has also been capital-constrained this year and has had to go for rights issues and extra debt issuance. This is very important, in my view, because the providers of capital are, first of all, under pressure themselves from their own balance sheets and, secondly, they have a lot of calls on their balance sheets. These are large companies, multinational companies, with the opportunity to choose where to place their bets and a good example might be the nuclear industry. A typical nuclear power station is going to cost, let us say, between £5 and £6 billion. These are huge

investments. Eighteen months ago, if we were talking, Britain was nicely positioned in the leadership of the new nuclear age. What we have seen over the last 18 months is that Italy has joined the nuclear race, Hungary, Poland, and Germany has reviewed under its new Government its nuclear policy and who knows whether they will go to new nuclear in time, so there is enormous pressure building up and, incidentally, what is quite interesting is that we must not forget that China wants to build 24.5 gigawatts of nuclear in short order, so there is tremendous pressure suddenly for nuclear build. There are very few companies with the skills to do it and huge amounts of capital needed to build it, so you have got a very, very changed environment, so I do believe, Chair, you are absolutely right, that finding the capital to come into our environment and provide the investment for Britain is going to be very important and companies will look, which I think Britain does well in, at the stability of the regime, the confidence that they have in the marketplace, in the Government, in the regulator and will take their view, but it is not like the halcyon days of six or seven years ago when the companies, if you look at E.ON or RWE, were net cash companies; now their balance sheets are full, so what are they going to do and how does Britain rank in their priorities going forward? I think capital is a very, very key issue within the debate going forward, and Project Discovery, I think, will have to, when it reaches its conclusion stage, take a view on the capital issue. Two particular issues with regard to Britain are that, and I have no personal issue with this or Ofgem has not, we are placing a substantial focus on nuclear and on offshore wind. Both are highly sophisticated with regard to technology, both are very capital intensive and, in an environment where project finance is not easy to find, this is why we keep returning to the big players because the big players have the capital and have the capital base, but the independents who might need project finance will find it very, very difficult, so you are asking investors to come into an investment arena in Britain where we have large, exciting projects ahead, but which are technically very demanding and require massive scale to get the projects off the ground.

Q5 Paddy Tipping: So what is going to happen if new nuclear or replacement of fossil fuel plants cannot be funded? It makes the likelihood of interruption greater then.
Mr Buchanan: These are the issues which, I think, the Government may be considering as it goes into next year, and it has its own 2050 report that it will be analysing. Looking at the way markets work, and we may well come on to the structure of markets and whether they do work, markets respond by giving a price, so, if the pricing signal is right, the investment will come to Britain and the issue will be: is the pricing signal correct?

Q6 Paddy Tipping: You talked earlier on about price rises for customers of 25 per cent. One of your scenarios suggests a price rise of 60 per cent.
Mr Buchanan: Indeed.

Q7 Paddy Tipping: Customers are struggling at the moment. Price rises like this are not very popular. What can be done about that?
Mr Buchanan: I think this is going to be one of the policy debates which will be centre of the outcome of Discovery and how it feeds into the Government's 2050 report next year. The Dash for Energy scenario which is the 60 per cent by, I think, 2015–16, it is uncomfortable and particularly uncomfortable for the vulnerable, and these are issues that we would have to address. If I might, Chair, I just wanted to give you a little bit before time, but we literally just got in, the Project Discovery consultation responses, and this is not all of them, by the way. Just to give you a sense as to where we are with regard to nearly 50 consultees, and it is a very serious set of returns, as you would expect, there are a couple of headlines, if I may, and that is all I can really give you at the moment and I will not name any companies or specifics because, in certain instances, they have asked for confidentiality on certain information, so we have to redact that, but that will be made public in due course. Apart from, which was nice, saying that Project Discovery was welcome and timely, the big message to me is that most of the consultees have said that we are too optimistic, and that is across industry feedback, major domestic consumer feedback, four of the big six, which might not surprise you so much, academics and specialists, so we have got to address the fact that, even in our report where we showed you the four scenarios and the stress tests where we showed you that we had seven red traffic lights sitting against our stress tests for 2020, there is a view that we might have been too optimistic. With particular regard to the stress tests, the kind of language that I have been picking up from the report is that we have not fully addressed, what they call, a 'double whammy' or a 'triple witching' which is where you get a layer of stress tests occurring at the same time. Additional stress tests that the consultees would like us to look at in more detail are investment delays, oil price shocks and the impact of differing gas qualities across Europe. With regard to our scenario analysis, again the concerns appear to rest most frequently on the fact that we are not putting in enough volatility to commodity prices, that we are not fully putting in the impacts of planning delays, that we, and this one surprised me, may be overestimating the impact of demand side as an amelioration to concerns and, finally, that we may be underestimating costs in one particular area which is very interesting, that a lot of our focus, and we may come on to this today, is on plant being closed down due to the Large Combustion Plant Directive. Well, there is another directive straight behind that called the IED, which is going to require a clean-up of NO_x and SO_x on a massive scale and there is a view that we have substantially underestimated the costs of that if it is going to be done, so this is really helpful feedback. I do not want to put a dampener on the next two hours, but those are the kinds of views that we are getting back and I

am trying to give you a sense of how this project is progressing and that is the flavour that we have got so far.

Q8 Paddy Tipping: Well, you are brightening up a beautiful December day! Just tell us this: you have set out the issues and you have set out the problems, but what are the solutions and when are you going to come back with parts two and three of Project Discovery?
Mr Buchanan: In terms of timing, we are very keen to align Project Discovery at the next stage where we will come out with our views and our recommendations to you and to the Government by the end of January/February. Now, there is an alignment that is going to occur at that time which is unique, I think, as an anorak following the sector and being in the sector, as I am, for some years. At that time, we are going to have the liquidity report coming out and the liquidity report is looking at the short-term market arrangements and whether they work, then you have got Discovery looking at the medium-term market arrangements and we have got a price report due within the next two weeks, but we will have the next one on retail prices at the same time. You have got a unique alignment of three substantial reports, two on wholesale and one on retail, where the Board is very keen to take the advantage of looking across those reports and taking a holistic view to see whether there are structural messages through the whole energy chain that are coming through those three reports, and we would obviously be very happy to come back and talk with this Committee in February, if that is suitable to you, but I think, for me, it is not just Project Discovery and that reporting timetable, but it is aligning the short term, medium term and retail to see whether there are actually structural issues here where we need to stand back and say, "This is affecting the whole energy chain and what do we do because of that?"

Q9 Paddy Tipping: We have talked a bit about investment and we have talked a bit about prices, and you have painted a gloomy picture. Can you just make our day and tell us how likely it is that there are going to be interruptions in supply in 2015–17, that kind of range? Clearly, it is a possibility.
Mr Buchanan: If you look at the scenario analysis that we have done, there is one particular scenario called 'slow growth', which is not great news because that is slow on environment and slow on economy, but what you will see with slow growth is particularly concerning because the slow growth scenario, of the four, is the one that has concern on both gas and electricity. On the gas side, it is concerning because our usage of gas continues to go up throughout the period to 2020, so there is no stabilisation and there is no fall, it goes up through the period. On the electricity side, the concern is that the plant margin, the reserve, spare margin, goes to as low as we would ever have seen it, down to three per cent. That is what I call 'sweaty palms' time, so, if you take that particular scenario, if you believe that we are in a slow economic growth period between now and 2020 and that, whilst we have aspirations for climate change, we are going to go slow on them, it is quite a tough outlook.
Paddy Tipping: You have just mentioned gas and in all the scenarios it looks as though there is going to be, in a way, a second dash for gas.

Q10 Sir Robert Smith: First of all, I should declare my entries in the Register of Members' Interests relevant to this inquiry. One is a shareholding in Shell, another is a visit to Total's carbon capture and storage demonstration plant in south-west France and the third is as honorary Vice President of Energy Action Scotland, a fuel poverty charity. In your scenarios, you obviously see us becoming more dependent on imported gas. What are the main risks to becoming more dependent on imported gas?
Mr Buchanan: Well, I think it is trying to calculate the probability of the risk. The two sources of gas are going to be primarily gas from Russia and Turkmenistan and LNG, and I think the issue then is going to hinge quite heavily on how we see the supply side delivering over the next ten years against our scenarios, and politically important, I believe, for Parliament and for Government is a very big call on how we think our relationship with Europe is going to develop. Perhaps I can deal with pipeline gas first and then LNG shipped gas second because we are going to be heavily reliant on gas and possibly up to 80 per cent is going to be imported and, therefore, let us deal with Russian gas first of all. The outlook for Russian gas is that they have to bring on in the next ten years three super-giant gasfields in western Siberia in order to replace their current gas. They are going to lose about 200bcm of their gas from around 600bcm to 400bcm, rather like we have from the North Sea, so they need to replace that. Their replacement mechanism is focused on three fields, and one is Bovanenkovo and another is Shtokman. Bovanenkovo has been delayed in the last six months by at least a year, and for Shtokman, it was announced this week that the original expectation date of 2013 has been delayed to 2015. Why might this be? This is because Gazprom, through no fault, in a way, of their own, has been hit by a double whammy this year. Its sales to Europe have collapsed from 156bcm to 142, its revenues have collapsed from around $65 billion to $45 billion from Europe alone, within Russia their demand has collapsed by ten per cent, and the expectation that they will be able to carry on investing on the back of price increases that would equalise a Muscovite with somebody in Europe by 2011–12 has gone and it has now been pushed back to 2013–14. The basis of what I am saying here is that the supply side has been hit by the credit crunch in a very substantial way and, therefore, gas that we have been expecting to arrive by a particular date is almost certainly going to be delayed. You may have seen the traffic light picture that I gave you earlier, which you can find in your Project Discovery book. This is a traffic light that I use with regard to when are the Russian three gasfields and three pipelines going to be available. What you have got to be looking for here are green and what you can see are very few and that is a real

concern, so, if we are looking at gas from Russia, yes, it will come, but it already appears that it is going to come a little bit late and we are sitting here looking at 2015–16. We may want to discuss whether we can get out of the LCPD, but, as it stands, that is what we are faced with in terms of an element of crunch on our capacity. So you have got gas from Russia, it will come, but will it come late because of the credit crisis? You have then got Turkmenistan, and Turkmenistan is incredibly important. Of the 200bcm that will have to come from Russia to Europe in 2020, 50 come from Turkmenistan. That is the calculation that we have currently made and analysts have made. A slightly worrying outlook at the moment is that Turkmenistan have just signed a major deal with China, so, if you look at 2020 at the moment, Turkmenistan will use about 30 for itself, it will possibly send 30 to China, ten through the Nabucco pipeline to Europe, 14 to Iran under contract and that is taking it up to 84. At the moment, Turkmenistan is producing around 60. The IEA announced last week that it thinks by 2020 Turkmenistan will be producing 90, so, if we are meant to be getting 50 from Turkmenistan via Russia, we are actually getting six, so there are some real issues there at the moment with regard to from where the gas is going to come if we have a Dash for Energy scenario. If it is a fast-growing recovery over the next ten years, then in that scenario there are issues. That then brings you to mainland Europe because, if there is an element of a shortfall from expectation from Russia and Turkmenistan, where does mainland Europe look? Well, we know where it looks because it has looked to us last winter and for 60 days of last winter we exported. We have developed in a market-based environment and we have attracted £12 billion worth of investment into our gas industry. We are going to have around 60bcm, possibly more, of LNG and the question will be: does that energy under market rules flow out of Britain to Europe, in other words, gas follows the cash, which is what it should do? The critical dilemma then, I think, politically is: are we comfortable that, at a certain point as that gas goes out of Britain, the price in Britain will obviously go up and you will get a reverse flow? Unless you are absolutely confident that that is going to happen, you need to really look very carefully as to whether the Anglo-Saxon model of markets is going to work with the near-Europe model of markets. Now, where are we on that near-Europe model of markets? Well, we can take a couple of steps back, and you will remember that Ofgem's gas probe of 2005–06 was driven by the fact that, when that arbitrage was meant to happen, the price was high in Britain and we said, "Come on, send us your gas" and it did not come. That was one of the key drivers, I believe, behind the third Directive which has just become law in September. Let us look at last winter. Did we come out of last winter wondering what on earth were some of the gas flows going on within Europe? Yes, we did. There were some strange movements. We also were not entirely sure why we were left with a couple of days' gas and a big gas storage facility at Bremen was left with 20 per cent in the middle of Europe. When you dig down into that, which obviously we have had to do and this is going to be a very important part of Discovery, you start to say, "Do we understand why there are constraints in the European system? Are they due to physical flows, which might be understandable, or are they actually due to long-term contracts?" which of course the British marketplace does not like and does not warrant, and we look to Brussels to make sure that long-term contracts are not struck in a way that lacks transparency. Now, what has transpired, we believe, is that in the flows between Benelux and Italy and in the flows east to west, over the next ten years it is virtually impossible to get additional flow into those networks because of long-term contracts. Now, one of the things that struck me, and I have not been aware of it and possibly I should have been, when we were doing our work on Project Discovery and Russian gas is that, of that 142bcm that I discussed this year that Europe took from Russia, most of it was on long-term contract, so around 140bcm is on long-term contract. The really amazing story here is that that goes up to 167bcm by 2025, so in fact the long-term contract structure that is almost inimical to markets working is going up over the next 15 years, not coming down, so, when we look into Europe, we say, "Well, how do we get confidence that there is access", which is a critical element of our market working, "and that there is transparency of information?" Now, in Great Britain over the years, with Ofgem prodding and pushing, we have access to immediate information on gas flows and on storage. In Europe, and Andrew can correct me here if I get the data wrong, but at the moment, we believe, in Europe we only still have 70 per cent of the information on storage and Britain has led a particular project in north-west Europe to try and get our neighbouring countries, which includes Germany, to agree to open up the information flow. WINGAS, which is the number two gas supplier in Germany which supplies 20 per cent within Germany, is not doing this yet. When I look at the key instruments of what tells me a market is working, are there constraints in the system, yes, but I do not know why there are, are long-term contracts being locked in, yes, do I have full information flow, no, do I have a history here that makes me concerned, possibly, when you add all that up and you add it to concerns about the supply side impacts on Russian and Turkmenistan gas, you are going to have to ask yourself some quite big questions about probabilities going forward as to what is going to happen if we get ourselves into any kind of supply crunch going forward. How will our closest neighbours work? The only example I can give you from my life is that for a couple of years I worked in New York as an American investment analyst and part of my patch was western America, California, and that was at the time of the Californian crisis and the associated Enron mess. One of the things that really struck me from that experience was that the western states created what was called the 'western interchange market', which actually worked quite well and there was flow between the states. As soon as California went down, Wyoming, Idaho and

Washington State all went to their local legislature, put laws in place and stopped the flow from their states, so they locked in flow to their states mainly because they had cheap hydropower and they did not want to send it to California because there was a crisis. I am making no subjective analysis there, that is what happened and, therefore, I think you are going to have to look at that quite carefully, so that is the gas by pipeline side. Let us have a look at LNG.

Q11 Sir Robert Smith: Just before you move on to LNG, I have just a parochial question, coming from the north-east of Scotland. Does that scenario you have painted make it quite sensible for the UK Government to try and maximise the prediction from our own resources and to avoid leaving any of it behind?
Mr Buchanan: It is a very good question. It may well lead to a view which, I think, Malcolm Wicks put forward, that, when you look at nuclear, rather than just to look at replacement, which I think was Malcolm's argument, you may actually want to take it higher, and I think he used a figure of 30 to 40 per cent.

Q12 Sir Robert Smith: Also, our own gas, should we leave it in the ground?
Mr Buchanan: I am sorry, I thought you were talking about diversity. I think that, as long as we have got a marketplace, which we have, it is going to be driven by costs and whether there are subsidies or not or tax breaks or not.

Q13 Sir Robert Smith: Because your scenario longer-term is quite frightening, but at the moment the investors are saying that it is a very flat, low, boring place for gas and the price is not staying loyal to them, but you are saying this is a temporary phenomenon in your scenarios.
Mr Buchanan: Well, in one of the scenarios, which is Dash for Energy which is assuming economic growth, it is worth pointing out that, just going back to that Russian example, in the last few days Medvedev has come out with, I think, some quite important statements. The first is that he is anticipating, given the recovery of the economy in Europe, gas to have gone 156, 142, 161 next year, so he is seeing that recovery and that is his expectation and, secondly, there has been a general move to see whether you can break gas and oil contract links, and they have said no way on their long-term contracts. Why this has been so relevant is that, because Europe has taken less gas this year, a couple of the companies, E.ON, Ruhrgas and Gas de France, have found themselves in a very uncomfortable position in their relationship with Gazprom because they have 'take or pay' contracts and they owe Gazprom a substantial amount of money for gas they have not taken. Within the last months, Cirelli of Gas de France and Bernotat of E.ON, they are the chief executives of those two companies, have made overtures to Moscow to see whether they can renegotiate or review contracts, and this has been the response: "Yes, maybe we can, but we're not going to look at the oil-gas index".

Q14 Sir Robert Smith: And on LNG then, again—
Mr Buchanan: Yes, it is a very good issue with regard to whether we have got a glut and whether LNG will continue to provide a glut. The concerns I have got, and I will ask Ian to come in on the LNG market, if I have two concerns on the LNG market, the first is the way the dynamics swing so quickly, so three years ago the Department of Energy in Washington was saying, "We're going to go from two per cent LNG to 30 per cent of all of our needs from LNG". Now, with shale, that has changed quite dramatically, but you have also got China saying, "We might well be stepping up from 40bcm of LNG to over 200", you have got India saying, "We're going from 40 to 75", and you have got Japan with quite a wide range of energy, so I think one of the concerns I have got is just how quickly the market can swing. The other concern I have got is that pipeline gas, and these are Shell figures, is cheaper than LNG up until the pipeline is more than 4,000km long, ie, LNG is expensive, the facility is expensive to build. If we are in fear of a glut, will we build those LNG facilities and, coming back to the Chair's opening statement about capital and investment, will that get built? In fact, at the very time that we need that LNG facility, possibly towards the end of the next decade, it was not built now, so those are my concerns with regard to LNG. Ian, do you want to add?
Mr Marlee: Another thing that our scenario analysis showed with the LNG market is the vast range of uncertainty out there about the amount of LNG that we think might be needed going forward, so, to give you an example, in our Green Stimulus scenario by 2020 we are looking at a global LNG demand of about 358bcm, whereas in our Dash for Energy it is 686. That is a massive range of uncertainty and, when you look, which is what we have to do when we think of how we are going to be protecting consumers going forward, when you look at the investor perspective on that, you have got investors out there, saying, "Given that huge range of uncertainty, what kind of investment should I be making in that LNG market?" so there are all the questions about whether it will flow, but there are also all the questions about what investment should actually occur and the kinds of uncertainties that are facing investors.

Q15 Sir Robert Smith: But, given this growing scenario of imported and the scenario of uncertainty, what is the role and how far behind are we in having enough gas storage to try and stabilise the UK market?
Mr Buchanan: I think there are two elements perhaps to the question. The first is that it is worth bearing in mind that we would be virtually physically self-sufficient if the LNG were regarded in the island market status. It is because we have the interconnection with Belgium and Holland that you cannot look at it in those terms and, therefore, it would be wrong to suggest that we will not have the facilities to meet, let us say, 100bcm of demand in 2020, and the DECC figure is massively lower than 100bcm, but let us just stay with 100bcm, and that will be comfortably met by LNG and pipeline from

Norway alone, so I am just concerned that that element of the debate does not get taken. I was going to go on to discuss Europe, but could you just remind me of the question?

Q16 Sir Robert Smith: My question was on the role of gas storage in this changing scenario.
Mr Buchanan: I think this may come into the debate on our relationship with Europe and the recommendations and potentially structural debate that we may have to have next year. As you are well aware, we have got around 4bcm of storage at four per cent[1], which is more or less what we had six or seven years ago, which is not good news, and a lot of key facilities have been blocked largely by planning, so let us hope the new planning regime enables that to push forward. Even still, it takes a lot of time, so my first issue would be that, if you are going to go there as a response, is it a timely response? If I can give an example, the big gas facility being built at Bergermeer in Holland, which will develop about a 6bcm gas storage facility in itself, was started in 2006 and will be available in 2013, so the first thing is: is this a timely response to our needs? The second is: is it a market response because Bergermeer is being built in the public and national interest in Holland? If you start to go round Europe, under public service obligations the majority of countries in Europe actually have a public service strategic, national tag to storage, so, for example, Hungary works on an ad hoc basis and that ad hoc basis is where the Hungarian Government have said that 20 per cent of their storage will be strategic. Ironically, Hungary has more storage than we do in total and that is surprising given its geographical location, so, of their 5/6bcm of storage, 1.2 is called 'strategic', and storage in Poland is being directed by the national company, so maybe these issues will have to be considered, but I think there are a lot of considerations along the way as to whether storage (a) is the answer (b) is timely and (c) is the right place to invest in.

Q17 Sir Robert Smith: So probably the more important thing is to get an alignment of signals in the market between mainland and island Europe?
Mr Buchanan: Yes, and, if you cannot do that, you are going to have to think very, very carefully about what you then do.

Q18 Dr Whitehead: The National Grid a little while ago published a scoping report on the potential for renewable gas into the mains gas pipelines in the UK and estimated that the potential by about 2020 could be possibly 15 per cent of UK domestic gas supplies. Have you looked at the possible impact that that might cause on (a) security of gas supplies and (b) general supply in terms of the various scenarios that you have put forward?
Mr Marlee: Yes, we have taken, if you like, a broader approach to that question and one of the things that we have looked at in the green scenarios is the amount of renewable heat that you can have on the system, and indeed our green scenarios suggest that you have about 12 per cent renewable heat by 2020 which approximately meets the Government's targets and that would be through a few things like biomethane, it would be through heat pumps and it would be through solar thermal, so we have taken, if you like, a broad kind of assumption on what that would be and how much that would cost.

Q19 Dr Whitehead: But you have not made an assumption on the extent to which renewable gas as a domestic supply might be placed into the gas mains basically?
Mr Marlee: We have not looked at it in that specific detail, no. We have looked at it more generally as how much renewable heat could you have on the system and then the effects and the costs of that are in the scenarios.

Q20 Dr Whitehead: On the wider question of supply, what specific look have you had at Azerbaijan's gas supply proposals and particularly the development of the Shakh-Deniz field and its supply through the Nabucco pipeline without going through Russia at all, although I understand that Gazprom is attempting to purchase a proportion of that output?
Mr Buchanan: That is a very interesting situation. The headline is that this is another delay, that the Shakh-Deniz field will probably be 2016 now instead of 2014, and it leads into an absolutely fascinating issue which you have touched on with regard to the Nabucco pipeline, which is the pipeline that comes through the furthest south, basically going from Turkmenistan across Caspian, through Turkey and then up in the underbelly of Europe. The reason why, if I may just give a little bit of colour on this project, is that this project initially was dogged by concerns about how the Member States were going to work on the pipeline, whether Turkey was going to demand to take 15 per cent of the offtake or whether it would allow it to be transit. Turkey has just about agreed to do that, although the Turkish Parliament at the moment is comparing the Nabucco European pipeline with a much more straightforward Turkey gas proposition, but let us assume that the gas pipeline can get built through Turkey. There is another immediate problem here because Turkey is seeking a rapprochement with Armenia and that is not going down well in Azerbaijan. The pipeline has to go through Azerbaijan, so you have an immediate political problem there. Assuming that they can solve that problem, they then have to get it under the Caspian. Iran and Russia have triggered a 1920s pact between them to say that the Caspian is theirs and no other country's and, if they can get that, and they want to go to international arbitration, if they can get that to hold, that is another delay on the project and that is before you have even got into Turkmenistan to find whether the gas is coming to Europe, China or Russia. You are absolutely right, in the meantime Gazprom has stepped in and has opened with Azerbaijan on taking a large slug of the Shakh-Deniz gas. The interesting element there for Nabucco is that Nabucco is looking to bring about 30bcm to Europe. It does not get probably to break

[1] *Note from the witness:* "four per cent demand in a normal year".

even until there are 16bcm. The first 16 do not come from Turkmenistan, they come from Shakh-Deniz and Iran, so, if you cannot get that eight from Azerbaijan and eight from Iran, this project is struggling on its economics, so you are absolutely right. Here we were ten years ago as a self-sufficient island, we have got gas coming from the North Sea, and now we are having to start to worry about the relationship between Turkey, Azerbaijan, Armenia and Russia and Azerbaijan and a pact from the 1920s on the Caspian. Really, to me, this is just a perfect illustration of how the energy outlook for us has gone from this very protected market status to this incredible interface, both geopolitical and economic, but also it does lead us to and comes back to the European question that we have been asked earlier with respect to whether we are trying to resolve and sort out our energy demands and requests with partners who do not have the same outlook of how they want to do business as we do, and I think that is a really key issue. Sorry for a long-winded answer, but it actually, for me, touched on such an interesting illustration of how difficult even one pipeline is in terms of how the politics will work.

Q21 Colin Challen: Can we just go back to Project Discovery because what I have heard so far, particularly in your first answer, perhaps the transcript should be cut out and pasted as a set text on the wall of every minister and aspiring minister in DECC; this is gobsmacking stuff. I want to know really, since we have a predictable crisis facing us, what can Project Discovery contribute to removing the unpredictability in the toolbox in dealing with this predictable crisis? It seems to me that the British national interest is really on the whim of others who have no concern for it.
Mr Buchanan: What I have to be careful about here is that I am not premature with our findings and certainly not premature with my own Board. We set out in October with four scenarios, we stress-tested those and we came out with seven red lights and one green light, which is not a great starting point in terms of looking forward. The consultation's consultees have said that we have been over-optimistic and now we have got to go back and stress-test whether we have been. Now, in the light of that, we have then got to come out with our best case review of that and, to a certain extent, come out with an analysis of probabilities because what we must not do is create fear and create a very unstable environment if the probability of what we are looking at is very remote. If, however, the Board feel that it is such a different environment, courtesy of the credit crisis, courtesy of environmental targets being very tough, courtesy of the environmental market in Europe not working properly and courtesy of the loss of our energy island status, if all of that combines to actually drive the Board to make recommendations that meet your concerns, then I am sure they will. The overriding message that we have wanted to give throughout this, and it is rather like the retail market probe that we did which, and I will be quite open as I have been open with the Committee before, was a little bit uncomfortable for Ofgem because there were things there that perhaps we could have got to before, but the quality of the report showed that we could sort out issues in the retail market which, I suspect, we are going to come on and talk about in a minute, and in this report again we have not wanted to constrain ourselves by saying that we are not prepared to look at a range of options and make those suggestions to Government. It is really important for me and my colleagues that this is exciting work, it is quite exacting work, but we are not the policy-makers. We are a statutory body of Government, we are doing this review under a section of the Utilities Act which we are required to do, but we will hand our work and ideas to you and to Government and you will then make key decisions on that.

Q22 Colin Challen: But you will be able to say, "We are in a mess", which is, I think, what you said this morning?
Mr Buchanan: I think what we will highlight, if that is the outturn, is that, of the four scenarios, and we may have more by the end of January, but just assuming that we do not, of the four scenarios, these scenarios will give you comfort on the following criteria and these scenarios will not. Comfort, I think, will not just rest on security of supply, but comfort may also rest on—and, by the way, two of our scenarios at the moment have GB substantially failing its renewables and carbon targets—particularly its renewable targets.

Q23 Colin Challen: What I am concerned about is that we do not repeat or perpetuate the mistakes, the policy errors that got us into this place in the first place. Are there any that you are going to leave untouched? You have referred to the markets in, I think, quite stout terms this morning. Is that something which does need to be addressed fundamentally?
Mr Buchanan: It might do.

Q24 Paddy Tipping: You have also referred to the role of Government, that everything you have said implies greater involvement, a bigger stake, to caricature the position.
Mr Buchanan: The outturn from this might be that the Government say, "We're absolutely convinced that markets will deliver, and there may be a price associated with that delivery because that's a feature of markets, but the markets will work". They worked in the 1990s. We had 30 new gigawatts out of 75 in, we had 24 out and the market delivered. We came through a mini electricity crisis in October 2003 and the market delivered. We came through a gas crisis actually on one specific day, 13 March 2006, when the National Grid said, "We don't think we'll have enough gas tomorrow", but we have come through those, so the question is: will the answer be to trust that the markets will deliver because the markets have, but it will be uncomfortable along the way, and it is like a rollercoaster, you have good times, you have bad times, but the market will

deliver, or will the combined impact of credit crisis, and loss of our energy island status, and the key issue there is the loss of our energy island status, mean that our interface is with regimes, companies and organisations that may not want to do business the way we do? It is not as if the loss of energy island status means that we are dealing with a like-for-like view of Anglo-Saxon markets, we are not, and I think that has become very clear, but I think the other thing that has happened over the last two years to go with the credit crisis is that we have signed up to these very tough renewable targets and we are obviously signed up to the LCPD Directive, which started in 2008. The other concern that I think we have got is that EU ETS trading in Phase II, to be fair, partly because of the economic slump, the price has been down at €8 and it is now trading at €13 and it really has not worked at all. There is a very powerful piece of research written by Macquarie Research team which is saying that in this first phase of Phase II of EU ETS, because coal has been as easy to run as gas, in fact we are going to have to run a hell of a lot more gas in Phase III to catch up with what we lost in Phase II, so there are some real issues, I think. Coming back to your concern that this problem has been here for some time, I really do not feel that, but I really feel that the market mechanism that Britain had adopted way back at the end of the 1980s and then obviously got opened up more and more through the 1990s was suitable to the market that we had at the time. The question is: is it going to be suitable in the light of this new information, these new events, going forward? I think that is such a big call.

Q25 Colin Challen: It was suitable and that was only a decade ago, and that is a very short timescale when we are talking about infrastructure investment and so on. What does the Government do with the highly liberalised version of the market that we have if we are faced with a 'keeping the lights on' kind of situation? What has to happen? What is our Plan B? Is it Project Discovery, which suggests that we are going to discover new things where we have not been before? Have you any thoughts on that? What has to happen in these circumstances?

Mr Buchanan: I think that the range of options here are that it may be that there are certain changes to the current market that we can make. For example, you may introduce a fairly simple mechanism, a capacity credit mechanism, you may go for a technical change, that there are technical issues where you could just say, "Well, our market isn't responding appropriately and it doesn't send a sharp enough message", and that may have its own issues as to whether you want to make the market message even more volatile and spiky, through to do we need to look at a strategic solution, do we need to look at a market-based solution, are there other market-based solutions around the world that we could adopt, do we need a hybrid solution, so you can see my hesitancy. We have got to do the work and we have got to talk this through with our Board colleagues, but I think the message that I want to leave you with is that we are not going to not pick up a stone and look underneath it, we are, and we will present the findings of that.

Q26 Charles Hendry: What is your assessment of the likelihood of a dispute between Russia and Ukraine this winter, especially ahead of the Ukrainian elections in January, and what will be the impact on the British market?

Mr Buchanan: I do not know if it is appropriate for me to answer that, but clearly in the run-up to the election in January, I think, we will be watching things quite carefully. It would appear both in Brussels and in Moscow that there is greater confidence that there is a relationship there that was not there before, so let us see.

Paddy Tipping: We have talked a lot about security of supply and let us just pursue that a bit more.

Q27 Mr Weir: We have depressed ourselves on gas, so perhaps we will depress ourselves on electricity supply. We know that something like 25 per cent of the UK's electricity generational capacity is scheduled to close by about 2018, but, certainly as far as DECC's transition plan is concerned, they appear to be reasonably confident that the amount of new generating capacity that is either planned in the pipeline or ready to go is greater than that. On the other hand, as far as your various scenarios are concerned, the low economic growth/low renewables scenario suggests a very high dependence on CCGT with the consequences that we have already talked about. On the other hand, a high level of green energy penetration would need to rely on the emergence of additional back-up and balancing capacity. What do you think the main influences and risks, therefore, are as far as capacity between now and 2025 is concerned, and where do you think the issues might pan out in between those various wholes of options?

Mr Buchanan: Taking the second part of your question first, if I may, this balancing capacity issue, I think, is one of the hidden stories and possibly hidden costs in the electricity story. I believe the National Grid have estimated that, were the nuclear programmes outlined by DECC to go forward, they would need to invest about £1.4 billion in an upgrade of the system; you have to upgrade the wires, you have to upgrade the substations, you have to ensure the system can work. PV Power have estimated that the ancillary services and reserve services that you would need to have in place for the fleet of nuke, each nuke will add about £1–2 per megawatt hour and today the price per megawatt hour is about £33 rising to, I think the forecast for next year is, £42, so that is quite a substantial cost per nuke, so that is the back-up costs. Coming to your forward point, we do not hide in our scenarios that two of our four scenarios are assuming that nuke does not come in on time and that the carbon capture pilot does not come in on time and indeed the Green Transition scenario, rather than the Green Stimulus, is the exciting one because that is growth on both green and economy, but the thing that strikes me about E.ON's assumptions there are that there is a very strong assumption of carbon capture fully subsidised and there is a very strong assumption that nuclear gets built possibly because there is a very strong assumption that there is a high carbon price. Now, all of those things have to come into play in one of the two scenarios where we think nuke and CCS will come into play, and of course in two we do not.

Mr Marlee: I think, as Alistair says, we do have a number of assumptions that have to be met for the green scenarios to come in, and I would emphasise that these are global scenarios and not domestic scenarios, so they are about concerted environmental action, not just GB action. I think that it is important, when you think just quickly about going back to the back-up question, that it is not just about the back-up in generation, but it is about flexibility in consumption of energy as well that would be required in the green scenarios and, therefore, it is about, if you are in those worlds, how do you have that flexible generation and how do you have that flexible consumption, so there are both sides of those that the scenarios throw up. We are not saying it is impossible to resolve those, we are saying they are issues that need to be considered. I think the generation one is, as Alistair said, particularly concerning because of the low load factors that it would imply on some of that back-up gas and, therefore, there is a real question as to (a) would the price spikes actually be sufficient to bring on that back-up generation and (b) actually would the price spikes at the moment be able to happen in the current arrangements we have got, so they are the kinds of issues we are looking at in the next phase.

Q28 Mr Weir: So the implied question there is: to what extent is it likely or possible that investors might be persuaded to invest in new power stations which will instantly be reserve back-up capacity and not substantially generational?

Mr Marlee: Absolutely because, as you will know, traditionally it has been the case that people will buy a generator for base-load and then, as it grows older, it will become back-up, so yes, you are right, that is a key question.

Q29 Mr Weir: Have you looked at the scenario of taking the six oil-fired power stations which presently produce a very small amount of input to the Grid and converting them to renewable or post-use oil supply, thereby overcoming the Large Combustion Plant Directive considerations?

Mr Marlee: The issue with the oil plants and with the coal plants under the LCPD is that obviously the time for derogations has passed and, clearly, people have made investment decisions now on the basis of those provisions, so at the moment we do not envisage changes to those. Clearly, if there is some kind of way in which they could become renewable and somehow slip through that net, then that would be something that we would be interested to hear about. We certainly have not seen that as being an option and certainly that is not reflected in our scenarios, given the legislation that is there.

Q30 Dr Whitehead: Your scenarios obviously also, as has been mentioned. take into account the succession of the Industrial Emissions Directive following the LCPD, which then gives options for residual generation of some power plants thereafter, either of transitional national plan or limited lifetime opt-out, by TNP or LLO, since we are about to descend into acronyms I think. How important *de facto* in terms of your scenarios would be the portion of plants that would decide to opt for working under one or other of those arrangements?

Mr Marlee: We have concentrated at the moment on the period 2015–16 in terms of the study that we have done, but clearly we have made different assumptions on IED coming in. I cannot give you the exact details now but we have allocated between those that go to TNP and those that go to LLO. Effectively, the TNP means that up until 2020 you have gradually to lower your emissions of SO_x and NO_x, sulphur and nitrous pollutants. You lower those up until 2020 and then thereafter in effect you can run at very low levels, I think it is 1,500 hours per year. On the lifetime opt-out effectively you have 20,000 hours and then you close in 2023. There are differences and the scenarios do assume different choices between those things, and, yes, that will affect the results you get. As I say, at the moment we have been concentrating on the supply issues for 2015–16 as opposed to beyond. To be honest, I think there is a whole new range of issues that will potentially come beyond the 2015–16 issues with regard to the 2020–23 issues, at which we have not looked at the moment in this project because we have been trying to focus on the middle of the next decade.

Mr Buchanan: Could I perhaps just give you a window into one of our major players' views on the IED and the assumptions that we have made? I will just read it out to you. We find the assumption of 19 units fitting selective catalytic reduction technology to be very unlikely to occur in reality, given the current marginal economics of doing so. In other words, if we are assuming conversion and therefore we continue to have the plant but converted plant, one of our major players is saying that you have to go and look at the marginal economics again because, frankly, we might just close it down. So we will need to have a look at that.

Mr Marlee: I think it is also worth saying, and I think this is sometimes not really considered in the context of the debate, that actually the decisions we make on CCS and the extent to which you have retrofitting, the extent to which you are going to have specific performance requirements, will also affect your decision under IED, and that is an interaction that very carefully needs to be looked at I think in terms of what comes out of the IED.

Q31 Dr Turner: You have discussed a lot the difficulties that market operations place on carbon-based electricity supplies. That is bad enough but of course market considerations also fundamentally affect renewable supplies. The first thing I would like to ask you is whether you think that the current electricity trading arrangements are fit for purpose and whether they need fundamental reform for the future. Certainly in the distant past they were very unfavourable to renewables and they are still not particularly favourable to renewables.

Mr Buchanan: I think the question is: do the current trading arrangements work, are they suitable for renewables? At the beginning of this session I outlined that we would be coming out with I think a report that will interest you greatly, which is called our Liquidity Report, which is looking at the short-term market arrangements, whether they are working, whether we can understand the constraints on the system, whether there is enough liquidity. When we came out with our consultation document a few months back, again rather like Project Discovery, we put on the table a range of options, depending on the outcomes—I will let Andrew take you through them in more detail—that went from minor changes to current arrangements through to major structural reform.

Mr Wright: We published a report a few months back which was a discussion document, so it did not really come out with a particular point of view in terms of what we should do. That is going to be delivered after Christmas. The picture that it gave on liquidity, and particularly on electricity, was not a very attractive one. We concluded that electricity market liquidity in the UK was low and that is low compared to the past; it is low compared to other comparable markets in the UK, such as the gas market, and also low compared to other electricity markets in other countries, such as Germany. We could see that that was potentially having some harmful effects and making it difficult for new entrants to come into the market, potentially leading to a larger spread between buy and sell prices in the market, and also potentially making it more difficult for participants to trade. We put forward a range of options, ranging from the very basic ones, such as supporting current initiatives to try and improve liquidity which was in the market to the more radical structural ones. It seems clear that the level of vertical integration in the industry has some impact on that. We will be coming out in January about our views about what should be done. Clearly, this has quite close links with Discovery, so I think we will be looking at which aspects of this ought to be rolled into the Discovery project and which aspects can be taken forward in their own right. In the consultation responses to that certainly we are still getting strong indications that small suppliers find it very difficult to get access to competitive wholesale energy. In terms of renewables and the suitability of the current arrangements, once again as a part of Project Discovery we are looking at the issue of how the current trading arrangements react to a very high level of intermittent generating plant that you will have if you have 30 per cent plus of wind on the system. Once again, it comes back to whether or not the price signals are right, whether they are sharp enough both to reward the back-up generation and indeed reward the wind generators appropriately as well. This is something that we are looking at. It is an issue that really comes to the fore towards the back end of the next decade but it is certainly something we ought to be looking at carefully as a part of Project Discovery.

Q32 Dr Turner: When BETTA was established, you as an organisation were very clear that you favoured location transmission charges, which of course is a bit unfortunate for renewables because they tend to be located at some distance from the notional centre of the system. Therefore, you are adding a potential extra disincentive to investment. Are you still of the view that location charges are the right way to do it?

Mr Buchanan: Currently we are of that view. Of course it is what we are doing for gas as well. Whilst wind farms for example in Scotland carry the higher charge, a higher TUoS (Transmission Use of System) charge, gas works in the opposite direction. Locational charge is what we are working with currently. We had a notable case called 148 where one of the green energy related companies sought to ensure that they had priority access into the system, almost as a way to get round this charge. We took QC's advice on that because they argued that that was a requirement of the Renewable Directive in Europe. The QC's advice was that they did not have a case at that time. We are willing to look at this on a case-by-case basis but at the moment the locational transmission charge is about 25 per cent of countries in Europe that use this route. That is what we are using at the moment. We spent a good deal of time talking about this when I last came in. I am happy to go back over that. We understand the concerns relating to that.

Q33 Dr Turner: Given our geography, perhaps it is not quite right to compare ourselves with other countries in Europe, which can operate on a much more central basis. Our geography and our location of energy supplies is somewhat different to other countries in Europe. Is it appropriate to draw the comparison with other European countries to justify locational transmission charges?

Mr Buchanan: That is a good question. I believe, and I want to check it, that Sweden and Norway use our approach and of course they have, particularly in the case of Sweden, a high degree of their renewable power in the north of the country, which they drag to the south. There are other countries with a similar dynamic to us who have gone down this route of pricing.

Paddy Tipping: You have just used the phrase "case-by-case".

Q34 Sir Robert Smith: I am slightly intrigued as a market regulator how that sends signals to the market that you will do things on a case-by-case basis.

Mr Buchanan: I must make myself clear. Thank you, Mr Tipping. The case-by-case basis means that each modification, each change to the rules, that comes to us we will treat on its merits; we will get legal advice as to what we can do. There is a big change that is opening up, which we are excited by and pleased by, that we have not been able to initiate any changes under the current rules. The current rules were set in place in the late 1990s when everybody believed that markets would work, that you would not need a regulator—you may think this still—that everything would work fine and you would have locational charging. Wind farms were not in people's imagination at that time at all. From next year we are going to be able to initiate change, and I am sure that we will have to address this issue because we have a sustainability duty as of last February. I think this is going to be quite an interesting thing for us to look at very carefully. If I can leave you with some confidence, the Board did examine that Case 148 very carefully with regard to our sustainability duty. That is why we went out for QC's advice on whether we could go with it or not.

Q35 John Robertson: This may be going off at a tangent slightly. You mentioned costs and you linked renewables and gas a minute ago in costs. When it is transferred down to the ordinary person, where is the security of supply to the poor who cannot afford to pay for the increased prices? Where does cost come in then?
Mr Buchanan: This is an absolutely key issue with regard to whether you allow the market model to carry on because the market model may carry with it some very peaky prices, some high prices, and it may be that you say that that is what comes of the market model. This is why to a certain extent the Government and Parliament are going to have to look at this to decide how we are going to balance these issues. How does affordability come into the debate on security of supply and attaining our carbon targets? I think you raise an absolutely fundamental question.

Q36 John Robertson: Are you saying that you are playing Pontius Pilot here—it is not my decision; it is somebody else's—and you are just passing the buck to somebody else? Should you not take some kind of initiative in this?
Mr Buchanan: I think what we would be planning to do is to give a range of recommendations and our advice. It really is the Government's decision I think in this instance and it would be inappropriate for a statutory body like ours to come out with a very strident view. What we have to do is give a range of propositions.

Q37 John Robertson: You would give advice?
Mr Buchanan: Yes; it is incumbent on us under statute to do that. I am very glad you raised the point because affordability in this debate can struggle to get a voice and we have to make sure that it is there. I completely agree with you.

Q38 Charles Hendry: You talked about the need for back-up capacity to take account of the inherent fluctuations which we get from different types of renewables. The other alternative would be to have pumped storage, battery technology, hydrogen, hot water, ways of transferring it from when the power is available actually to having it available when the need is there. Have you looked at the extra costs which are involved in doing that and how do you balance that up in terms of security of supply which it creates?
Mr Buchanan: That is a very good question.
Mr Marlee: We have not looked at the specific costs. We are very interested in the electricity storage issue. At the moment, it is certainly the case that we have not seen storage that looks commercially viable on a large scale, although, having said that, clearly there have been recent announcements about pumped storage. Certainly none of the more technological, innovative new approaches have yet been seen to be commercially viable on a large scale. These may play big roles alongside demand-side response and flexibility of back-up in the future.

Q39 Charles Hendry: In looking at the commercial viability, do you also look at the fact that there has not had to be investment in a hydrocarbon-based back-up and so there are many hundreds of millions of feet of plant which would be saved and that could therefore be seen as offsetting some of the costs elsewhere?
Mr Marlee: Absolutely, and that would be part of the whole issue. We know that Grid is doing work in this area as well. Grid is looking at the potential for electricity storage to be a player in that kind of context in 2020 and beyond. At the moment, I think more work is needed to demonstrate the commercial viability of such options, but to be honest we are neutral in that respect to the different ways in which you might be able to meet the needs of that back-up generation or the flexibility of consumption that we were talking about before. As I say, we think that electricity storage may have a role to play in that.

Q40 Charles Hendry: Can I ask as well about the funding mechanisms. The ROC system is one of the most generous systems in Europe. I think only Belgium and Italy which have a more generous system, but it has delivered far less investment in the United Kingdom. Is that because of structural problems—issues like planning and the regulatory system—or is it more to do with the funding mechanism itself, that the feed-in tariff is a more simple mechanism, although perhaps less generous? Have you come to a conclusion on that?
Mr Buchanan: From listening to the companies, I think they would argue that it is planning that has been the main drag. We talked to the Scottish Executive. When Scotland put their planning changes through, they have opened up the potential for wind farm development in Scotland in the last 18 months, so it may well be that it has been planning. There is no doubt in my mind that there has been a substantial hiccup caused by the credit crisis with regard to the development of new fields, but I am hoping that is going to get back on track. There was, without doubt, a hesitation in the marketplace.

Q41 Charles Hendry: But you do not think that a switch to a feed-in tariff based system would provide greater simplicity?
Mr Buchanan: Ofgem has been public in its position on ROC. We think that potentially there are mechanisms but we have got ROC; we administer it; and that is what we have at the moment, so that is what we will deal with. Of course the feed-in tariff is being introduced, which is baby ROCs, for you and me, from April next year, so you are going to get both going forward. The question is whether you actually just focus on feed-in tariff and move away from ROC, and that is a big political policy decision.

Q42 Dr Turner: Your scenarios include not only the green scenario but also scenarios where we completely fail to meet our renewables and emissions targets, which would be something of a disaster. Why do you think those scenarios might come to pass? Do you think it is because we still do not have the right policy instruments to encourage renewable energy development in deployment in Britain? Charles Hendry has just referred to the debate on ROCs versus feed-in tariffs. Feed-in tariffs are not the only element of Germany's success in deploying renewable energy for instance; a lot of other measures go into their Renewable Energy Act which we do not have. Could you give us your view on that? What more might we do to promote renewable energy?
Mr Marlee: Let me come to your first question which is: why do we have these in here? As a reminder, these are global scenarios; they are not domestic scenarios, if you like.

Q43 Dr Turner: But they do apply to us domestically.
Mr Marlee: Absolutely, but the non-green scenarios are in a context where there is not agreement on climate change and really security of supply issues have prevailed globally over those kinds of issues. Why have we included those? We went out at the beginning of this project and talked to a number of stakeholders about their views on security of supply going forward, including very importantly, as I said before, the companies and the investors and how they are viewing the world. The scenarios that we put together actually reflected the views that were coming back to us about the fact that there are uncertainties out there on a global scale as to the extent to which the environmental targets will be made and then will be kept to. We felt it was very important actually to look at a full range of possible futures, and again none of these are forecasts, which included the possible future that you do not get this international commitment to climate change. In doing so, we certainly were not making a comment on the UK's commitment to the climate change challenge. In that sense, our green scenarios then said: In effect, what would you be looking at in a world where there was this international commitment to climate change and what would you be doing in terms of promoting those kinds of renewables on the system? To that extent, the scenarios are not really designed in that sense, to answer your question. Certainly for us the next stage of work we are doing is looking at the extent to which, if you like, there are blocks to the system that would stop you from moving towards those kinds of areas. I think that is something that we will be looking at in terms of the next stage of the project.

Q44 Dr Turner: But you have not considered that at this stage.
Mr Buchanan: May I add that we are looking at three substantial schemes that the Government has put in place, as you are aware: the feed-in tariff April 2010; the heat incentive April 2011; and then the carbon capture levy will kick in and from what I can see the estimate will be about 3 per cent of your bill—well over £30. One of the things that interests me with regard to what is going forward is on the demand side and the energy efficiency side. What is going to come after CERT in 2013? What is the package then? It would be nice to have some clarity as to whether the focus that has been on energy efficiency and demand-side reduction up until that point—and it will be about £1 billion a year by then—is just stopped. I think that is a really big issue.

Q45 Dr Turner: You have a sustainability responsibility now. Where does it fit in your minds in the hierarchy with which you address problems? Do you consider it a primary duty or is it something that you do when you have satisfied yourself on market competitiveness and security of supply? If you think it is more important, how do you intend to address that responsibility?
Mr Buchanan: The Board takes this very seriously. Two examples I can give from recent decisions perhaps illustrate that. A couple of weeks ago the Board authorised a £900 million spend on the transmission network, which is the first tranche of the £4.6 billion spend, which will include the coastal route development: it is broadly Scotland to England and it is a huge investment. They wanted to send a message with regard to this investment. Effectively that investment is at 6.25 per cent return. Last week, Water announced that they were offering a 5.1 per cent return. We wanted to make a statement that clearly defined projects associated with sustainability and renewables would get an element of kick-start. In a way, judge us by what we say. Early next Monday morning, we will be making a statement about the local electricity companies' five-year price controls and what they can invest. Again, I think you will find that there is a very strong sustainability message in the announcement that we can make.

Q46 Dr Turner: How great a problem is going to be protecting consumers from high prices associated with extra renewables if there is an increase in the carbon price? Would an increase in the carbon price resolve that problem?
Mr Buchanan: The increase in the carbon price will find its way into the electricity price, which comes back to the affordability concern. One of the things that we have to do in our job is to make sure that where we have direct responsibility or oversight, we can ensure that the monies that are being spent with

regard to renewables and sustainability are spent in the most competitive and value-for-money way that we can ensure. If I can use an example at the moment where I think this is coming through very well, that is in the offshore regime. Next Friday we will be announcing the winners at this stage through round one, and it is a very encouraging story. Here we have a hybrid of market and regulation and so we have competition to build the cables. The good news, and I will explain this more next week, is that it has been active competition but in competing to get the right for a 20-year regulated return, they have shown us their hand very clearly as to what rate of return they need for that kind of regulated utility. I will not say any more other than to say it is very competitive and it is very exciting because it shows to me where you can take a competitive instinct and associate it with a regulated return. We have both working very well together. Therefore, in that instance we can say that a substantial amount of money, this is £1.5 billion, is going to feed its way through to the consumer's bill—the cable costs out to the wind farm—but we have done it in a way whereby we can turn round to the consumer and say, "Yes, it is a cost to the sustainability because the wind farm is getting at two times ROC, but our oversight to that is to ensure that there has been value for money".

Paddy Tipping: We will consider in a minute the issue of investment in capital markets that we talked about earlier on.

Q47 Sir Robert Smith: You mentioned demand management in 2013. Presumably by 2013 we will only have scratched the surface of what we need to do to our housing stock in terms of making it highly energy efficient? In a sense, to deliver beyond 2013 it is not too soon to start having in place some schemes so we do not have this stop-start system of momentum?

Mr Buchanan: I think the greater clarity that one can give the better. Going back to my concern about the EU ETS mechanism, the whole of Europe was meant to move to a fully auctioned mechanism in 2013. Great, we have clarity; we know where the market is going to go. Then most of eastern Europe decided not to do it and they said, "We will be there in 2020". Wow! Just a change like that is dramatic to the confidence in the market. I do agree with you that the sooner that one can know how these instruments are going to work going forward, the better, but I do think that is an issue of public policy and not regulatory policy.

Q48 Mr Weir: I declare an interest. Like Sir Robert, I visited the Total plant in France. Under your four scenarios, under the green scenarios there is approximately double the investments required under the other two scenarios, but the consumer gas and electricity bills are not significantly higher, and for many years are predicted to be lower. That seems to be counterintuitive. Can you explain how that comes about?

Mr Marlee: The prices are dependent on a number of factors. One of them is the level of investment that is required under each scenario, but clearly also energy efficiency will have a role in terms of prices to the extent that if there is greater efficiency, then that means that people are consuming less and therefore that will affect bills. Similarly, commodity prices will play a big role, so there are different assumptions of commodity prices under the different scenarios. Linked to that there is then the question of the marginal cost of generation. Clearly in the green scenarios the marginal cost of generation is often lower because you have lots of wind or nuclear on the system. Those four things are really interacting, which is what leads you to the difference in prices. If I give you a feel for that, in the current electricity price it is about £197 for wholesale electricity cost per customer; in green stimulus it is £176; whereas in dash for energy it is £236. Clearly, whilst you have more investment that is being recovered under the green scenarios, actually you have commodity prices that are then taking the prices in a different direction.

Q49 Mr Weir: Do you think the customers understand the need for investment in the role of wholesale prices? It is interesting that several times you have mentioned the impact on consumer bills of these schemes. I notice that Centrica for example are now noting on their bills the percentage of the bill that is due to these green initiatives. How do you see consumers reacting to that? Do they understand the need for it?

Mr Buchanan: I think this is a very important issue and in January we are going to do a bit of a show, if anybody wants to come along, on the new company E-Serve. We have already explained when we launch E-Serve but it is going to become a very important issue in terms of communication with consumers that the 9 per cent of their bill that was 0 per cent 10 years ago but it is 9 per cent now that is associated with green-related projects will be well over 20 per cent by 2020. We need to explain that so that people understand that we are really looking at quite a dramatic change in the bill. Where the majority was wholesale cost, the next was network cost and then you had a very small subsidy. What it is going to be is: wholesale cost; subsidy; and network charge. That network charge is going to be 15 per cent of your bill; subsidy by 2025 30 per cent of your bill; and the rest will be wholesale. It is a huge chunk of your bill that is being driven by CERT, CESP, levies, ROC, FIT—the acronyms just go on and on. I need to send you a glossary for that. It is the commonest of impacts. I really welcome your question because it is absolutely incumbent on us to represent clearly to consumers that with E-Serve we are just a delivery agent; we run these things for the Government, but we need to tell the consumers what it is costing them so that they fully understand what the cost is to make Britain a nicer place to live in for our children and our grandchildren.

Q50 Mr Weir: Given that Centrica have already started this, is there a case for insisting that all the companies set this out clearly so that consumers know what they are paying for?

Mr Buchanan: I think we need to take that away and have a look at it quite carefully.

Q51 Mr Weir: The Government's new Energy Bill that is coming before us includes obviously the levy for CCS but also new mandatory schemes to tackle fuel poverty. Some have raised a question with the interaction between the fuel poverty schemes and those who are not on these schemes and their ever increasing bills. Do you see that as a problem for getting that over to consumers in the near future?
Mr Buchanan: I do believe, and this comes back to Mr Robertson's question, that when you take the two wholesale reports, our retail report and you add the concern on affordability, there are some big decisions to be made as to how you are going to align affordability with security of supply and with carbon. You are right; there are some schemes that do a lot of good, like Warm Front, and I think one-third of Warm Front's focus does not go to the right people. It is easy to be critical because two-thirds does. Maybe we could get the tailoring of these projects better but that is a project answer. I think the bigger picture is very much a political policy decision that has to be taken as to where affordability is going to sit there.

Q52 Paddy Tipping: You have moved on really to where we want to be, which is to talk about domestic bills.
Mr Buchanan: And we managed that very carefully!

Q53 Paddy Tipping: As a regulator you can fix anything and clearly that is the case. We have half an hour at the most to talk about bills now. Alistair, you have told us about the add-ons to the bill. I get a lot of customers who basically say that the wicked energy companies are making a lot of money, the wholesale price of gas is going down and that is not reflected in our bills. As a result of that and your visit to Number 11 and elsewhere, you are now doing a quarterly report about the bills. Let me just check out these figures with you. You say that the annual gross margins were £170 per dual fuel customer; £80 per electricity customer; and £110 per gas customer. What people want to know is what the profit element in that is. What are the Big Six taking away from that? Can you help us?
Mr Buchanan: We will. We are going to put net margin and value chain figures into the next report that will be published in the next two weeks. It is a point that this committee made to us when we met in private a few weeks ago and we have taken that point and we will show that. I think that is important.
Mr Wright: One other initiative is that as part of the probe we have put a license condition on other companies to require them to publish financial reports, which will separate out their supply margins and profits from their generation margins and profits. During 2010 we should start to get the companies providing their own information, which I think will aid transparency. I can probably give you some help on the net margin front now. In the probe we did look at the operating costs of the companies. Roughly speaking, an operating cost was £110 per dual fuel customer. If you set that against the £170, then that suggests there will be a net margin of £60. It should be remembered that since the probe we have gone into a recession; demand has fallen; bad debt costs have increased and cash management costs. Our expectation would be that that £110, even with efficiency improvements, may well be higher; and the £60 equates roughly to a 5 per cent net margin. We have fallen short of arguing whether or not that is too high or too low. Another thing that is worth observing is that the average gross margin over the last three years has been £110, which suggests that the companies have made a net margin close to nothing over that period. I am not feeling too sorry for them because that is a period of relatively high generation profits when the companies are making a lot of money because of high oil and gas prices in their generation profits, but, nonetheless, I think it does put that gross margin figure into some sort of context and hopefully that is helpful for you.
Mr Buchanan: I think this is why the alignment of the liquidity, the discovery and the retail reports are really very important. We have to see the interaction there and whether we feel there is a structural inadequacy here that is impeding the market and the market price.

Q54 Paddy Tipping: How willing are the companies to talk to you about this? Presumably they are saying: "This is commercial information and really we do not want to unpick our accounts in public". What kind of response are you getting from them?
Mr Buchanan: Obviously under the probe we use the powers of the Enterprise Act, so they have to give that to us whether they like it or not. They have to give everything to us as well. We have all their information and we now believe that our in-house model is a very good representation of the aggregate of them. Clearly they will be running their own strategies as they should in a competitive market, but it has given us a much better handle on where the companies are. We have a dialogue with the companies. As you know, I have been particularly disappointed with the paucity of their communication with their customers. I think generally it has been staggeringly bad in the last couple of years. I would have to give credit to two companies, which I do not often do in public. I do believe Scottish and Southern and British Gas have seriously picked up their game in the last three months, and full credit to them for the various things that they are doing with their consumer group. I think we are seeing some encouragement there.

Q55 Paddy Tipping: It is interesting that those are both British-owned companies?
Mr Buchanan: It is interesting.

Q56 Paddy Tipping: Is there a message there to wider European stakeholders?
Mr Buchanan: No. I just think it is interesting.

Q57 Paddy Tipping: I am a very practical person. I know the winter is coming. It was cold last night. I am going to get a lot of correspondence soon from constituents who will say that bill are too high. Where are prices going to go this winter and over the next 12 months?

Mr Buchanan: We are watching them very carefully. When the Secretary of State came to see you a few weeks ago he quoted the six-month figure. We make the point in our quarterly report which we put out at the end of September that if wholesale prices stayed low, then one would anticipate, certainly on the gas side, some form of reduction and if not—and this is where the communication is so important—you should go and communicate with your customers as to why the price is not coming down. It is transparency of information; if you have transparency of information, what you are starting to do is to say "we do not want market instruments". We are in a very important period for the companies. As I say, two of them appear to be responding to that well and seeking to build a relationship with their customers to explain the issues that Andrew and myself have been talking about.

Paddy Tipping: You will know that there is pressure within Parliament for a Competition inquiry.

Q58 Mr Weir: Taking that forward, the first question is: what is your position on the case for a Competition Commission referral?

Mr Buchanan: Our position on the Competition Commission is that it is there to be used. It is something that we should feel comfortable with. We have sent a couple of cases to the CC in the last three years. It may well be that the price control that I announce next Monday will have some of the companies going to the Competition Commission, and that is great because we get value from the Competition Commission and their rulings. What my board is basically looking at at the moment—and to give you confidence, we review it as you would expect very carefully every month but particularly at the moment in the light of the September quarterly report—is how well the probe is being rolled out because the probe is effectively going through in stages. The rules and regulations were put into place on 1 September, so we have new regulations on undue price discrimination and cost reflectivity. I am sure somebody will want to pick up the PPM issue and we will give you a clear answer on that because if there were an issue on prepayment meters being discriminated, this is exactly the licence condition on which we can go after the companies. I am very pleased to have that in place. The probe package is rolling out in stages, so the new doorstep selling will be out on 15 January; the new rules for small businesses will be out on 18 January. We are in the phase of roll-out. The first thing the Board is saying is: Is the probe being rolled out; are the companies putting their elbow into this? The second, obviously with regard to the law, is: do we have reasonable suspicion to send these companies because they are effectively blocking competition? If you look back over the last few months, the competitive elements that you might want to look at are: communication with customers, switching and customer gains—Scottish and Southern announced another £100,000 gain in the last six months. There is still a lot of competition for customers and customers are clearly choosing at the moment. One of the big findings from the probe, and it is easy to forget it because quite rightly we focused on the negative in the probe, was that customers liked the right to switch and actually found switching quite easy. The problem with the probe was that they were being misdirected to take the wrong deal, and this is why we need the new doorstep and direct sales rules in place on 15 January and small commercial customers felt very badly chewed out by the companies. It is really a package. I want to leave you with the view that we are watching this very carefully. Behind this is a question that quite rightly my board are raising which is: are there structural issues here—and the Liquidity Report might be quite vital in this—that are stopping new entrants coming in, that are stopping an even greater level of competition? Why is not Tesco's coming into the market? We do have small players coming into the market; companies like First Utility appear to be thriving in the marketplace at the moment, which is good news. In terms of asking if there is a structural problem there, that is the kind of thing that we are very much going to address with liquidity and discovery reports on the table in January.

Q59 Mr Weir: You clearly feel that the probe is making progress in the areas of concern, yet, despite that, since the probe was put into place, there seems to be even greater pressure for a referral to the Competition Commission. Why do you think that is? Is it just because prices are going up and people feel instinctively that there is something wrong?

Mr Buchanan: That could well be the case. Part of the problem is that in getting everything into place, getting the new rules and everything changed, there is an element of time lag. The old saying is that the proof of the cake is in the eating. We will not be able to judge the quality of the cake until spring next year and that is part of the issue, but I do not want in any way to leave you with the view that we are going to sit back and wait to see how the probe goes. If Andrew and Ian's data and analysis says to the board that something is seriously wrong here, then my board will have no problem in saying "Let us lob it out to the CC".

Q60 Mr Weir: When the Secretary of State was here, he was asked about this. His point was that if it is a referral to the Competition Commission that effectively kicks it into the long grass, it will be a couple of years probably until it goes through. What is your view on the length of time a referral would take? Would that impact on other things you are doing through the probe perhaps to deal with some of these problems? Would it freeze issues, for example?

Mr Buchanan: May I be quite clear with regard to how I think the board views this. It may well be that the Secretary of State has a good case. Certainly, if he were to send it, for example, rather than us, there are four hurdles over which he has to go before he can even send it. Let us say he said, "I want to send it tomorrow", he probably will not be able to get it to the CC until the middle of next year. If it is a narrow CC, the general view that I have heard is 12 to 24 months. It is worth, though, questioning whether when you are looking at the retail market, it is possible not to go upstream, to have a look at the wholesale market. As soon as you have made that move, then possibly you are looking at a greater length of time. The LPG review took four or five years. Given what we have been discussing with regard to security of supply, those are interesting timescales, but my board would make their judgment on the reasonable suspicion issue; it is secondary and could not be the primary driver to go or not to go to a CC. I think the Secretary of State has some interesting issues as why he might not want to go down that route.

Q61 Mr Weir: You mentioned earlier that some of the big European companies were rumoured to be looking to sell off some of their UK arms. If that were to happen, would you be looking for new entrants into the market rather than consolidation by some of the other Big Six companies that currently operate?
Mr Buchanan: Currently, it is on the network side that we are alive to sales. We would operate under the normal rules there, which are that we retain the right to ask for this to go to a Competition Commission if we feel uncomfortable and any purchaser will have to weigh up that consideration. We have seven groups controlling 14 companies. Competition and comparative regulation were very important particularly during the first ten years of regulation in the 1990s because you are basically squeezing the costs and really hitting the under-performers. As you know, we are going to announce in January our roadmap for a completely different approach to network regulation going forward. That is partly because we have been through that process. A purchaser has to weigh up in their bid and make a judgment on whether the board at Ofgem feels that below a certain number or if a company owns simply too many network companies—but they are all monopolies, we regulate all of them—we are going to ask for it to go to a CC.
Paddy Tipping: We talked about communication with customers. One of the ways is through their bills.

Q62 Judy Mallaber: First, may I take up the point of the new rules banning differential prices by payment type? How confident are you that that is going to have the desired effect and how on earth are you going to stop companies just artificially inflating their bills and saying, "Actually the cost of prepayment meters to us is higher than previously said and we get more through people paying by standard bills or direct debit". How are you going to stop that happening? Do you think that the ban will have the effect that you want?
Mr Wright: Yes, we think that the new rules that we have on payment differentials have already had a substantial effect. I think most of the companies saw the writing on the wall during the probe investigation, so we saw a substantial narrowing of the differentials during the investigation. When we delivered the report, I think partly under pressure from us and under pressure from the Secretary of State, we saw companies make further moves. We think there have been very substantial benefits. At the time we valued that at £500 million. Obviously at some point we will go back and audit that after the event and see whether that is the case. On an ongoing basis, we continue to monitor the level of differentials. Obviously it is more difficult to monitor what is happening to the companies' cost differences because that requires us to ask for information from the companies. We cannot do that on a continual basis. Some time over the next 12 to 18 months, we will be going back and asking for more information, but we do have the information from the probe, which gives us a good benchmark against which we can assess whether or not something is untoward in the tariff structures that we can see in the public domain.

Q63 Judy Mallaber: You say that you cannot do it on a continuing basis. Why not? Why once a year can you not say, "Give us this information so that we can check out that you have not suddenly slid in the way you have allocated costs"?
Mr Wright: We may well do it once a year. We have only just put these licence changes in place on the retail remedy side, as I have said, and we are putting in place now, the team having delivered that, the monitoring and enforcement infrastructure necessary to make sure these have the desired effect. We may well ask for that sort of information on an annual basis. The information that we have is 2008 information, so it is not that far out of date. I think where we do have some concerns about the currency of that information is on the standard credit side where we know that bad debt costs and credit costs will have changed significantly as a result of the financial crisis. I think that is one area where it may be worthwhile trying to get more information more quickly. On other prepayment side, we would hope that companies become more efficient in managing prepayment services over time and hopefully by shining a light on the level of those costs and the differentials, we can perhaps encourage them to be so.

Q64 Judy Mallaber: Moving on to social tariffs, what proportion of customers' bills are used to fund social tariffs?
Mr Wright: The figure is just north of £200 million by year three of the voluntary arrangements. That is my understanding. I do not have the precise figure. Maybe one of my colleagues can get that. That is set against total industry revenues for electricity and gas from the domestic sector of probably approaching £20 billion. You are probably looking at around 1 per cent.

Q65 Judy Mallaber: Did you give us the figure earlier of the proportion that is used to cost environmental improvements?
Mr Wright: I think the figure is 9 per cent.

Q66 Judy Mallaber: So it is 1 per cent on social tariffs and 9 per cent on environmental provisions?
Mr Wright: Roughly speaking, yes; there is the scale for the voluntary agreements.

Q67 Judy Mallaber: On bills, Alistair, you were a bit damning earlier about how opaque the bills still are but I thought that was your responsibility. Have you not imposed a new licence condition that bills must be clear and easy to understand? Is it then your responsibility to go back and make sure that they are? This report is still very damning.
Mr Buchanan: We have done so and next year you are going to get annual statements showing you what tariff you are on and how much you use annually. That is all part of the probe package. This again comes back to needing to get the cake out there and cooked and then see how well it is operating.

Q68 Judy Mallaber: There have been fairly damning reports from both Which? and The Plain English Campaign. What about this phrase in the Which? Report that "the regulator's efforts to address confusing tariffs are weak and impossible to enforce, leaving consumers struggling to find and keep a good deal". Would you care to comment?
Mr Buchanan: The Secretary of State gave a very good answer on tariffs which is that to a certain extent the consumer, from a lot of the data we had and the data in the probe, likes to shop and can shop. What we have to do is make sure that the information is clear, that the consumer is not misled on the doorstep. I think this comes back to your point about the bill because four million people are choosing to go for a fixed option; about one and a half to two million people are choosing to buy on the internet. It is clear that customers are looking at the range of tariffs and are picking out tariffs that are suitable to them.

Q69 Judy Mallaber: You say "customers". Obviously some people find that easier to understand than others. Are you saying that *Which?*'s criticisms are not right? They say that it is still very confusing and that is the evidence of their findings.
Mr Buchanan: I agree with you that there is a degree of confusion and consumer focus has a role to play here. With Citizen's Advice Bureau, we are running again this year, after a very successful launch year, Energy—Best Deal where we work with the Citizen's Advice Bureau folk and tell them about tariffs and how to speak about the tariffs on the phones. We are doing our bit to try and help get clarity for those who want more information about what they are looking at.
Mr Wright: It is worth emphasising all the things that we have put in place to try to reduce the degree of confusion in the market and to improve the information that customers have from the information on the bills to the annual statement, which is above and beyond the original request, and with on the doorstep selling making sure that people are given good information and a fair comparison on the doorstep. We have introduced new standards of conduct. Although they are not in themselves enforceable, we do take them very seriously and have urged the companies to take them very seriously. These include one of the standards of conduct that tariffs should not be unnecessarily complicated. We will monitor a company's performance against this; we will highlight good practice; and also name and shame where we think companies are being gratuitously complex and confusing and that is not in the interests of customers. If we do not see progress against these standards, we are quite willing to take further action but we wanted to give the companies a chance to respond to these standards of conduct. That is partly, as Alistair said, because customers do value choice and we did not want to do anything which dampened down the ability for suppliers to create new products and which may well be things that customers like and want. We are trying to strike that balance. If we see no progress in this area, we will take action going forward. We are doing many other things to help consumers find their way through the maze of tariffs that exists at the moment.

Q70 Judy Mallaber: Many of my constituents do not particularly think about choice. They find it all quite confusing. I found it confusing when I was suddenly approached in Sainsbury's by somebody wanting me to sign up to some new contract there, and I am meant to know about these things and understand them. I do not understand why it has taken so long to simplify bills and to get this information out. Why are you giving them until next July to simplify the bills? Why can they not do it now?
Mr Wright: That is the length of time it takes to get the system changes in place to comply with the changes in licence conditions that we put there. Potentially I share your concern about the length of time it has taken. It is worth saying that to get these licence changes through, we do need to get the agreements of companies to those licence changes. If they are saying that they are going to reject the licence change because they cannot deliver it on time, we have to take that seriously. Our only alternative is to go to the Competition Commission on that licence change, and that could take a lot longer.
Mr Buchanan: We welcome reports like those of Which? because they keep us under pressure. There are just two things that I want to pick out. First, if I am allow to plug them but Which? has, and you will see why I am doing so, is that Utility Warehouse EBICo are given full marks for their bills and having easy bills to understand. How encouraging it is that these are competitive offerings. Would that the other companies were at their standard, but I am very pleased that they picked them out. The second issue here, and because we were going to make an announcement I have been given permission by my sustainability senior partner to mention it today, is

that I think Which? is touching on a very strong nerve when they talk about why companies have 65 days. We have just created a consumer panel of 100 people; we are going to ask them to have a look at this. Although the general probe package that Andrew has been talking about will get a full review in 2012, if we think this needs particular action sooner than that, then we will pursue that.

Q71 Judy Mallaber: Why do you have to wait for a panel? Why can you not just tell them it is not acceptable? I do not know of anywhere else where somebody would take 65 days to tell me the price of something that I was buying was going up. You name another supplier of anything that I buy that would take 65 days to tell me?
Mr Buchanan: It is good for us to talk directly with our consumer panel on this. That is what we are going to do. This is going to be their first project to look at.

Q72 Dr Turner: We have had a lot of argument in this place over the years about your responsibilities and your remit, which has been subtly modified over the years. From much of your evidence this morning, it seems quite obvious that even if you had the will to do certain things, to regulate severely, you do not have the means. What further powers to you think Ofgem needs to be effective?
Mr Buchanan: We very much welcome the powers that are in the current Energy Bill with regard to market abuse. We believe that is going to enable us to get to a breakdown if there are generators abusing their position. There are many more generators on the system from single wind farms through to the major players and, frankly, the Competition Act is a noble Act but it takes a very long time to bring a case and to move on. We started our case against National Grid, and supported by the Competition Appeals Tribunal now, in our view on their manipulation of the meter market way back in 2002–03; it is still under appeal in 2009. We are very pleased that the Government is going to give us this extra power because it means that we can get to a breakdown quickly. This committee has been very helpful in supporting that, and I appreciate that. In terms of the retail market and the previous questions which focused on how can we ensure that companies behave in the retail market, how can we ensure that they do not abuse discrimination and customer reflectivity, we have now put the licence condition in place, so we have taken a very major step back towards regulating and rule-making within the marketplace. As Andrew has indicated, we will have no problem hunting down companies under that licence condition if they breach it. If there are further areas where you think we should have additional powers, I would welcome the opportunity to discuss that.

Q73 Dr Turner: Will you for instance then be able by direct regulation to enforce companies to stop taking as long as three months to inform their customers of a price rise? Will you have powers to deal directly with that sort of abuse?
Mr Wright: Yes, we do. It is a licence condition already; we can make a change to that licence to say that they have to inform people more quickly or even in advance if we so choose. With any licence change, the companies have the ability to reject it. If they reject it, it is then referred to the Competition Commission and we will have to make our case to them that it is in the customers' interests.

Q74 Dr Turner: So you do not at present have direct powers?
Mr Wright: That is the way that it works. The companies have the right to appeal against any decision.
Mr Buchanan: It is not immediately enforceable, as you rightly point out.
Mr Wright: That is right. We need to get that licence condition in place.

Q75 Dr Turner: Will the proposed changes in the Energy Act give you that power of enforcement?
Mr Buchanan: In this specific area, no. There is one other important change that they are making. At the moment, and it is an absurdity, we have a one-year retrospective period that we can use if we want to assert a penalty on misbehaviour. The current Energy Bill is going to change that, which we welcome.

Q76 Sir Robert Smith: Going back to the security of supply and the impact on consumers in the country, those of us who lived through the Seventies know that if there is not enough electricity generation about, then you have power cuts and phased power cuts, and when there is electricity, you switch the lights back on. What is the situation with gas? How much more dramatic is it if you start having a shortage of gas? Obviously there are the market implications of price spikes and expensive high energy users. You then have people coming off the system with the big energy users. My understanding is that with gas if there comes a critical point where you start to have to shut down networks, you get air lock problems. It is not just a question of when there is more gas about, you just turn it back on again. What sort of scale is that?
Mr Wright: Hopefully, it would never happen. If you get to the point where you had to isolate large areas of the low pressure networks across the country, then that could have very profound implications. I think potentially it takes a number of months to restore the supply because you have to check gas safety on a premises-by-premises basis before you can reconnect. I think there was a case last Christmas in a village in Lancashire. That gives you an indication of the small scale with only a couple of hundred houses and what would happen if this happened on a large scale. There are two points. One is that if you have gas smart meters installed which have the ability, as with prepayment meters, for remote safe disconnection, then that could reduce the implications with that sort of incident, so there could

be a benefit from smart metering there. The second point is that this is part of what we are considering in Project Discovery to make sure that when the consequences of a security of supply failure are very profound, that is properly reflected in the market mechanisms, either by somehow ensuring it cannot happen or by making sure that the price signals are so severe that nobody would ever want to go there. This is something of which we are aware and are concerned about.

Paddy Tipping: Andrew, Ian and Alistair, thank you very much indeed. This has been a very wide-ranging discussion. First, we have a good understanding of the problems. Unfortunately, we are not at all clear as to all the solutions. Secondly, you have made a number of points on the differentiation between your work and the work of government which it is important to keep in mind. We look forward to phases two and three of Project Discovery. Thank you very much indeed.

Wednesday 24 February 2010

Members present

Mr David Anderson	John Robertson
Charles Hendry	Sir Robert Smith
Miss Julie Kirkbride	Paddy Tipping
Anne Main	Dr Desmond Turner
Judy Mallaber	Mr Mike Weir

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

Witnesses: **Mr Alistair Buchanan**, Chief Executive, **Mr Andrew Wright**, Senior Partner, Markets, and **Mr Ian Marlee**, Partner, Trading Arrangements, Ofgem, gave evidence.

Q77 Paddy Tipping: A warm welcome to colleagues from Ofgem: Alistair Buchanan, the Chief Executive; Ian Marlee, the Partner for Trading Arrangements; and Andrew Wright, the Senior Partner for Markets. Welcome to you all. Thank you for coming. I know that time is fairly short. We are starting a few minutes early, but I know you need to be away for ten o'clock. As Betty Boothroyd, my old friend, used to say, we will keep the questions short and the answers snappy. This is an important report. I thought you were a market liberal and now some people are describing you as a Stalinist. What is the change? What has brought this about? Why have you come forward with these five scenarios?

Mr Buchanan: To a certain extent the report that we published a few weeks ago was the follow-on from the report we came to talk to you about in December with regard to October. At the time you will remember that we had identified what I call the unholy trinity affecting the sector of credit crisis, carbon price and carbon institution crisis, and a real concern that because of the timing of plant coming off the system in GB we were exposed to gas markets in a way that we had not anticipated. From the consultations that we took and the additional work that we did, and I am happy to go into both of those areas in more detail, we came to the conclusion that with regard to security of supply, with some concern, I think, from the board, they did not take this action lightly, we wanted to signal first of all that we have got reasonable doubts about the security of supply situation going forward under a number of scenarios and, fully recognising that we are not the policy lead here, it is very much the Government, and you are very influential in that yourselves, we wanted to provide a range of options. Within those options, as you will have seen, we have given five. If you went for option A you would broadly say this is the Ofgem that you have come to understand with regard to trying to find solutions that are drawn off market-based actions through to what some would regard as a more radical option where we talk about the concept of a central energy buyer or central energy purchaser. What we did not go on to do was to push out further, which some journalists have done, notably in the *Daily Telegraph*, where they said, "Well, Ofgem offered five options, they could have offered seven" and six and seven in their view would have been full re-regulation and full re-nationalisation, and that would have taken you to the most radical extreme of change. My board did not feel that they wanted or needed to go there. I think that is where this concept of, "They have swung from markets to Stalinism"—to use your language—has come from. In fact, what we have done is to say we think there is an issue that needs to be looked at very carefully, we have reasonable doubts about security of supply and here are some options, but they are by no means an exclusive list of options.

Q78 Paddy Tipping: How many other options did you look at?

Mr Buchanan: I think what is quite interesting here with regard to analysing this situation is that the Government will have a number of suggestions with regard to the energy structure side from ourselves, from other advisers, and at the same time they are going to be looking at the financial side because arguably there are two elements to this debate. One is: "are the current arrangements, the current industry structures, suitable, fit for purpose for security of supply?"—and the other side is—"is there a financing issue, and this comes to the first of the unholy trinity, the credit crisis, financing solutions that may be able to resolve this issue—?". Therefore, those in Government, I think, are going to be able to look at the range of optionality pulling in both advice from the financial community and advice from institutions like Ofgem and they will be able to come to a conclusion on what the balance is between those two issues.

Q79 Paddy Tipping: If I have got this right you are suggesting—these are ballpark figures—that £200 billion worth of investment is needed by 2020 to replace ageing plant.

Mr Buchanan: Yes.

Q80 Paddy Tipping: What are the prospects of getting that?

Mr Buchanan: That is a very good question and it is very pertinent to my previous answer, which was the financing side. This is a huge challenge without question. If we look at the generation side, if you take the 200 billion scenario traditional generation might require around £100 billion of investment in itself, and you have seen those numbers raised by various finance houses in the City of London. To put that in context, the water industry, which had a regulated return, RPI protected, mandated by Europe largely for the spend, spent 85 billion in 20 years. We have got to spend 110 versus what we know was a tremendous programme in the water sector. Also to put it in context, the market value of all power stations today in GB is about 50 billion, so the scale of spend is quite extraordinary. It is a very important question with regard to the scale is so enormous, and to a certain extent the investment that we may be looking at to protect us on the security of supply side is what you might call discretionary investment because it is not regulated, nor is it what some financiers call neo-regulated because wind, particularly onshore, is regarded as a neo-regulated return because you have got this very large and protected subsidy. This is discretionary spend. In areas where we have chosen, as a country, to look at nuclear, offshore wind, carbon capture, Severn Barrage, these are vast sums of money. Nuclear alone might be £5 billion a station, London Array £1 billion to £2 billion, carbon capture we are still not entirely sure of the scale of that but the Secretary of State has intimated that it will be worth about three per cent of our bills, and that will be the Carbon Capture Levy, so these are enormous sums of money. Consequently, you are looking at not only the scale but who can provide that money and who wants to provide that money in a capital market that is quite active. There is plenty of money out there but, to a certain extent, I believe at the moment we have got the regulated businesses and the subsidised generation businesses which leaves us with a question, which is how then are we going to ensure that we get the financing attractive enough to come into this discretionary unregulated area of investment. One of the answers takes you right back to what Ofgem is looking at, which is to get clarity, consistency and surety about the market arrangements and maybe we need to make changes, so we have listed A to E as propositions to give that additional confidence to the providers of finance. I do believe this is a really critical issue.

Q81 Paddy Tipping: If I were the Chief Executive of EDF and publicly say I am going to have new nuclear power running by 2017 I would be in detailed talks with financial institutions at the moment and I guess I would be getting a hard time, would I not?
Mr Buchanan: One would hope that all potential parties to build would be in detailed discussions with financial parties. One of the rules of thumb that I know is used by both major companies and their investment advisers is broadly that they look at an acceptable level of risk being about five per cent of your enterprise value in any one particular project. If you look at EDF, that is a £160 billion company, enterprise value, so you are looking at five per cent, which is about £8 billion, so you are looking at one to two new power stations there, so they can analyse that risk and no doubt they are talking to their financiers about how they will do that. Equally, EDF have been quite strong on the debate with regard to a carbon price.

Q82 Paddy Tipping: We will come to carbon prices in a moment. As you say, your autumn report, the first report, produced a lot of interest and I think you got a lot of responses back. One of the things that came out of it was people said you were too optimistic, that the situation was even bleaker than you described. Is that fair?
Mr Buchanan: I cannot say to our respondents "You are not being fair". It is a fact that the majority of them by quite a substantial majority felt that we were being optimistic. Typically, the respondents came in on different areas. For example, two areas that I found particularly very interesting were the sense that we had under-analysed the impact of the Industrial Emissions Directive, in other words we are all focused on the Large Combustion Plant Directive but the Industrial Emissions Directive comes in behind that and you have basically got 19GW of both gas and coal-fired plant, already treated coal-fired plant, having to be further improved with regard to emissions. That was a good example of where perhaps in our analysis we needed to go back and look. We also needed to look at gas quality. The gas quality in Britain is different from the gas quality in Europe. We had to analyse the impact potentially of whether the additional gas that we need to draw from Europe needs to be converted and who is going to convert that and what is the financial incentive for a company to build the appropriate conversion plant. It was issues like that that I think were very helpful to our modelling. Ian, do you want to add to that?
Mr Marlee: A number of people raised specific issues that we have then gone back and looked at and remodelled to a certain extent. As Alistair mentioned, we did run a few extra stress tests on the back of what people said as well. One of them was related to gas quality, the other one was related to what would happen in effect if electricity generation was delayed by a number of years. We went back and ran those kinds of stress tests which gave us interesting results. Particularly it did lead us to confirm our previous concerns that any kind of delay by just two or three years does lead us to think that we are less resilient to the kinds of shocks to the system that we have identified before. In effect, a lot of those things confirmed our concerns and led us to go back and ask have we looked at the full range of issues and what might the possible policy responses be.

Q83 Mr Anderson: You said at the beginning you had not anticipated being where you are, yet other than the depth and length of the financial crisis every other issue was relatively well known, so how did you not anticipate we would be where we are?
Mr Buchanan: If we were analysing this issue, and indeed we spent some time looking at it, even three years ago, you are right, we did not have the impact of the credit crisis. The credit crisis affects all of the other issues in a very substantial way and I will try and pick it up, if I may. If we go on to carbon, what has become quite clear in the last couple of years is that there has been doubt about whether the institution within Europe, the EU ETS trading

scheme, is going to work as originally planned. The East Europeans have signalled that they would not want to go to a fully open market in 2013, they would want to go to 2020, creating a degree of doubt about the institution. The recession, linked to the credit crisis, has led to profound weakness in the carbon price in the last two years, so it is not working as it should have done. The price moved up as we went towards Copenhagen, but with the failure of Copenhagen the price has fallen away again and, therefore, there is both a concern about the value and the institution that was not there two years ago. The third element was the importance of the international gas markets. Whilst, on the one hand, people correctly say Russia has not cut off Germany since the Second World War, what we have noticed in the last few years is three years ago we had Ukraine-Russia, then we had Georgia-Russia, then we had Ukraine-Russia and this winter we have had a standoff between Kaliningrad and Minsk and Moscow, which has been very uncomfortable. The attention on the nature of the supply is much higher, but even there the credit crisis has had a substantial impact on Gazprom and, therefore, we have seen, for example, Bovanenko, one of the key gas fields they were going to develop, being pushed back in time. We have also seen one of the key gas fields called Shtokman delayed by three to four years, and that was announced two weeks ago. These facts have actually combined in a way now that was not there three years ago. You are absolutely right, we always knew that the large combustion plant was going to take a chunk of our generation out, but we believed where we were two or three years ago that the market would be broadly able to handle that as it had handled the winter of 2005–06 fairly well.

Q84 Mr Anderson: We also knew that we were getting gas from pretty dodgy countries. Can I move on to something other than that? You talk about the £200 billion that is going to be needed. Does that not essentially put us as a Government in a really bad negotiating situation because if the companies say, "We cannot raise this money", effectively they will come to the Government with a begging bowl held out and the only answer we can say is, "Go away" and if we say "Go away" the lights go off. We are in a situation where we have got no options and this is because of the failure of the market system.

Mr Buchanan: I think the importance of Project Discovery but also, I believe, of the Government bringing out on Budget Day the 2050 route map, and there is another paper coming out with regard to energy market arrangements, is that to a certain extent the Government is acknowledging that we do have a window of opportunity. In the next three to four years we have, in fact, rising power station reserve margins and we have comfortable gas positions. Clearly you can never say there will not be a problem, because you may have a number of problems occurring at a single moment in time that may lead to some shortage, but all things being equal we have three to four years to look at the situation and see if we need to make changes. Now is the time that we can do that. With regard to the Big 6 or the Big 4, which I think the first part of your questions was alluding to, I think you can probably look at it in two ways. On the one hand, you might say it is very good news that we have four of the six largest global utilities in Great Britain, they are here, they are involved and, therefore, this is something they will want to invest in. You may also say that because of the nature of the choices that Britain appears to be pursuing, which is nuclear, large-scale wind, particularly offshore wind, if you look at Crown Estates' auction rounds two and three and also who is in round one, these are only the major players, the major utilities who we know are in this field because of the scale of the uncertainty of the investment that it requires. Carbon capture, again it is only the main players. It is the scale, the skills base and the appetite to be in this space that are issues that will have to be addressed very carefully. I believe quite strongly that the Government is looking at this and will come out with a solution that is best for the country. I do not think they sit there saying, "We have got to do something that is necessarily best for a Big 6".

Q85 Mr Anderson: They might have no choice if the Big 6 say, "We cannot raise the finance, therefore you have got to give us it".

Mr Buchanan: I think this is why there are some serious discussions going on with regard to should we look at financing solutions, is there a financial solution that may entail a degree of government involvement that provides some kind of financing instrument, so some kind of trust, some kind of Green Bank, some kind of private-public partnership, maybe a municipality style approach, some kind of financing approach which means if your view is shared by those who make the decisions, which is we are concerned that perhaps the answers all lead you to the same companies and we want to have competitive instincts here, then there may be some kind of public finance element to that. I am not in that position, I do not get all that information, although I know those debates are going on.

Q86 John Robertson: Did you look at the manipulation of the price of gas from these gas countries and also the Big 6 and what they were paying for it, how they were buying it and whether they could do better in relation to the contracts they had with these countries?

Mr Buchanan: I think this is a really interesting issue with regard to our relationship with Europe going forward. One of the interesting features of Europe is that about 160 bcm this year of Europe gas will come from Russia and about 140 of that is under long-term contract. Interestingly, given that is not a model that we like and we do not think that DG Comp in Brussels like that, that goes up to 167 billion with Russia by 2025. What has been very interesting this winter is that Gaz de France and E.ON Ruhrgas, because demand has fallen, have effectively been caught short in their contracts with Gazprom under "must take, must pay" contracts and they have made serious approaches to Gazprom to address two issues: "First of all, can we look at renegotiating this somehow and, secondly, do we have to have our gas contracts linked to oil?" Gazprom has been very firm on this and said, "We will stick to our long-term contracts, we are not keen to open negotiation, and we will stick to oil-linked gas contracts". In the last few days E.ON's chief executive has said, without giving much detail, that they have had some very small movement from Gazprom on this, but I think it is an absolutely central issue when we look at our working relationship with Europe going forward that they have structures, long-term contracts, public service obligations, strategic storage, things which we do not have, and we need to look at how our market-based approach will align with the issues that they are dealing with.

Paddy Tipping: Can we just park that whole issue of Europe and the international market for a moment and we will come back to it. Can we talk about the domestic market a bit more?

Q87 Sir Robert Smith: I must remind the Committee of relevant entries in the Register of Members' Interests as a shareholder in Shell, a visit to Total's carbon capture and storage project in south-west France paid for by Total, and also Vice-President of Energy Action Scotland, a fuel poverty charity. You have talked a lot about how you see all these new ways of looking at the market now, but just four years ago you told the IEA that "markets deliver entrepreneurial solutions and that markets deliver". Is what you are looking at mainly an electricity market problem or are you now saying that back then when you were answering questions on the gas market you had not fully understood what was going on?

Mr Buchanan: I think it comes back to the question from your colleague, Mr Anderson, earlier with regard to the last four years having seen some fairly dramatic changes. I do think that in addition to what I call the unholy trinity you have got short-term changes that can be made in the marketplace, and we announced one of them earlier this week on liquidity, that we can improve current market arrangements, but also affordability. Affordability, given the pressures that we are looking at going forward, has become a very pressing issue. I think it is that combination of five factors that has driven us to change our view. I do not change the view on the entrepreneurial issue, which is that if there is a solution across our A to E range of options that is towards the A side, more the market-based side, you are going to keep innovation and entrepreneurial flair very much in the market. If you drive towards E, and even beyond E, then innovation gets driven out because there you are prescribing a solution and I do not think innovation flourishes so well in that environment.

Q88 Sir Robert Smith: Do you think the very existence of this report would put a delay on any market decisions because presumably anyone operating at the moment is going to have to think, "Hang on a minute, this is a big pebble lobbed into the pool, what are the consequences?"

Mr Buchanan: I actually think by addressing it now and, as I say, the Government is looking at this very closely, in a way it stops that from occurring. The investment managers that I have spoken to with regard to this are fully alive to the reports that have come out from Malcolm Wicks, from Pöyry, from Ernst & Young, from their own analyses, and if there is one thing that frightens them possibly more than anything else it is that were nothing to be done or were no formal clarity to be provided to the situation there is a real chance that as we go towards the middle of this decade prices will not only go up but will become fantastically volatile. That is not good news for the consumer, and that in turn is not good for the investor because the investor will be extremely worried about the fact that there will need to be possibly random political intervention, as they would see it, because the social and affordability consequences of that are not acceptable. Consequently, I think by looking at it now when we have this window of opportunity, when we have this surplus power station situation and comfortable gas situation, it is a good time to do it currently.

Q89 Sir Robert Smith: You say the Government is also looking at it. Is it the role of the regulator to say, "I do not like the regulations I am operating"? Did the Government sanction this report or encourage it? Where did the regulator fit in in actually deciding what their regulations should be?

Mr Buchanan: I think there are two elements to that answer. The first sits within our statutory duties. Sections 47 and 48 of the Utility Act have provisions for us to do this kind of work, so it is within the nature of what we do. You will remember we did a big gas probe back in 2005 when we were uncomfortable about the lack of arbitrage between ourselves and Europe. That took us upstream. Some people said that we should not have been putting ExxonMobil, Shell and BP under pressure, but we felt that we needed to do that at the time. Within statute we are acting. What would be outside of statute would be for us to take airs and graces with regard to us being the policy call on this, and we have not gone into that space at all. That is where we are approaching it from. I should say in response to the previous question that affordability and the consumer, but particularly affordability, have to be critical issues for an organisation like Ofgem and when we look forward we are concerned about affordability.

Q90 Charles Hendry: First of all, can I say I think this is one of the most thoughtful and constructive assessments of the challenges we face and of the options which are available to us. Looking specifically at the market issue, the market approach over 20 years has delivered some of the cheapest prices for consumers of gas and electricity in Europe. One of the ways in which it has done that is by sweating assets. Whereas in other countries we have been more investment in new assets, in the United Kingdom we have seen old assets being sweated towards the end of their natural lives. To what extent do you think, therefore, the market approach has created the crisis which you are now setting out and this huge mountain of investment which now needs to be found?

Mr Buchanan: There are two elements to that. I do believe that a market-based approach does ensure that managers seek to operate their plants as efficiently as possible. If we look back over the last 20 years we have seen 40 per cent of the power station fleet renewed and we have seen £12 billion worth of investment in the gas infrastructure in the early part of this decade, so there has been massive investment to leave us in a position today where looking forward over the next three to four years we do have power station surplus and we do have a comfortable position on gas. The market has worked and by and large worked very well for the consumer. I do think it is this combination of events in the last two to three years led by Brussels, but also clearly led by London where as a country we wish to hit certain renewable targets, certain carbon targets, and nuclear has basically been allowed to rejoin the party as an acceptable fuel source, so a whole series of events have occurred and on top of that, particularly coming back to carbon, the carbon price and the carbon institutions have got question marks over them. For the best part of the last 20 years that was not an issue but it is clearly a profound issue to the market going forward, a central issue. Markets do work, I think they have worked well, but the change, particularly with regard to climate change being such an important driver within the energy scene, means that we have to look at whether the current arrangements are suitable going forward.

Q91 Charles Hendry: Looking at that concept, a number of aspects appear to have changed, some of which you have touched on there, but we do now need to appeal to international companies to invest in Britain which was not the case historically, we were awash with our own oil and gas and countries from around the world were keen to invest here, but that has clearly changed. The need to include low carbon in the mix means the market can probably choose between energy security and pricing, but when it has got three issues to choose between then probably it needs some steer from government. Also, earlier you touched on the Large Combustion Plant Directive. To what extent do you think that has exacerbated the issues? Some people are saying there should be a derogation sought to allow some lifetime extension to plant within that, but that seems to be fraught with issues. Do you see that as an option and something which should be explored?

Mr Buchanan: Just by way of the options, there has been a range of options put forward. Scottish and Southern in their responses to us said, "Can we delay the Industrial Emissions Directive?" and the CBI said, "Can we reduce our renewables targets from 32 per cent to 25?" There has been a range of options put forward. Let me pick up the LCPD. Maybe it is doable, that is for government to take a view on, but looking at it from my perspective I sense there might be some serious legal challenges from environmental groups, potentially from those companies that have cleaned up their power stations. Why should they clean up their stock and have a lower thermal efficiency because of it on their power stations to allow another plant that has not cleaned itself up to get on the system running at potentially a higher or equal thermal efficiency? I think there are some big issues there. The practicality, which I think some of the chief executives have been very open about, is that they are not spending any money on this plant. Some of this plant will be just rundown plant. If you want to keep it going you are going to have to invest in that and where is that going to come from, how much. There are some profound legal issues. There are some issues with regard to whether the plant itself will need a huge reinvestment just to keep it going even for another few years and, of course, from a policy and social side is that what we want, do we want to keep old dirty coal-fired stations running? That is a policy decision.

Q92 Charles Hendry: You talk about the next three or four years as being relatively easy and then the challenges come in after that. The scope for building new plant in that timescale is fairly limited: nuclear cannot be until the end of the decade; coal and carbon capture is the same timescale; mass rollout of renewables the same sort of timescale, end of the decade. Gas would appear to be about the only one which can be done quickly. Is it your assessment that gas has to be a more substantial part of the mix in the middle of this decade than it is at the moment?

Mr Buchanan: Through our scenarios we highlight that in two of the four scenarios gas increases through to the 2020 period, in two of them gas plateaus and then depending on the degree of success arguably on energy efficiency you may see further reductions from our gas build. To answer your question simply, gas is a very important fuel over the next decade.

Mr Wright: One thing to point out is a significant amount of gas is already under construction so it is certain that the proportion of our power generation that comes from gas will increase over the next four or five years. Whether or not we need additional gas stations beyond those already under construction depends very much on the impact of energy efficiency, the rate of growth of the economy and electricity demand that we make.

Paddy Tipping: That takes us back to the very interesting discussion you were having with Mr Robertson about the position of Gazprom. Shall we talk about gas a bit?

Q93 Mr Weir: How significant a risk is the UK's interdependence with international gas markets?

Mr Buchanan: We are going to be very interdependent with them because on most forecasts we will only be taking 20 per cent or even less of our own gas by 2020, so with our interface through the pipelines to the gas fields of Middle Asia, particularly Turkmenistan and Gazprom, and through the shipping, LNG, it is going to be absolutely critical for us to have a good understanding of what is going on in that space. There is a third space, which is shale gas. Shale gas appears to be part of the answer, a very significant part of the answer for North America. One of the key issues with Discovery and the issues that we all have to address is for Great Britain it is about timing. We have this time issue between around 2015 and, let us say, 2022–23. The initial work being done on shale gas within Europe is very limited at the moment. Within the European context there may be some finds, particularly in areas like Hungary, but there are major geological issues, major environmental issues, major social issues to a population that is very environmentally and climate change aware as to whether we can develop that. Critically, can it be developed fast enough with regard to our timescale? Shale may be an answer within the European context in due course, but certainly from all the analyses I have seen we are not going to see that this side of when we are looking at with regard to challenge. Therefore, that takes us back to the quality of the supply sources, LNG and/or gas from Russia and Middle Asia, and then the quality of our relationships with the countries from which the pipelines are going to come and/or their relationships with the supplies. We are very much inter-related.

Q94 Mr Weir: For years now we have talked about the difference between the liberalised market in the UK and the European market and we have pressed Europe to liberalise more, to become more transparent. One of the things from Project Discovery seems to be that we may be stepping back from the liberalised market to a more controlled market. I just wonder where that leaves UK Government policy as regards the push to liberalise markets in the European Union.
Mr Buchanan: Certainly part of the issues that we raise in our optionality is whether we need to address some of the issues that they use, and have been using this winter incidentally, a difficult winter across Europe, with regard to either public service obligations or strategic storage. If you go back to the 2004 Security of Supply Directive, Brussels allowed countries to use market or non-market instruments. Looking across Europe, most Member States pursue either or both of strategic storage and public service obligations.

Q95 Mr Weir: The last proposal, the Third Energy Package in 2007, was part of the glacial movement in Europe towards a more liberalised market, but are you basically telling us we need to look again at this and rather than pushing Europe for a more liberalised market we have to perhaps engage with them in having a more controlled market throughout Europe for the purposes of energy security and that is a reversal of the previous mantra of consumer choice?
Mr Buchanan: I certainly think the analysis which we have done, and I am sure Government is doing their own, has to address the fairly fundamental issue of are we absolutely convinced that there is free flow in the network. In 2007 DG Comp in Brussels came to the conclusion that there was not going to be much free flow east to west on any of the gas pipelines, or Belgium to Italy, the two major trunk routes, because they were tied up through long-term contracts which, therefore, does not lead one to believe that there is a lot of flexibility there. When we look at our relationship with Europe, and it slightly comes back to our gas probe of 2005—you are right to say the Third Directive went through in September—the Third Directive arguably is one, two, three: one, unbundling to a greater or lesser extent of grid companies away from vertically integrated utilities; two, creating independent regulation; and, three, more information. The third was more information, but even when we look at the information flow still with regard to gas storage there are big gaps in our information because it is not provided and it is certainly not provided in real time. When we got to the end of last winter, which was a difficult winter in Britain last year, a one in twenty winter, and we analysed what the gas flows were around Europe, we did notice substantial gas flows between countries that we could not understand on an economic basis, which leads us to the conclusion that maybe this needs to be analysed quite carefully.

Q96 Mr Weir: We have discussed in this Committee and the Business Committee about the interconnector between the UK and Europe and the gas flows there. Can you tell us in the winter that I suppose we are currently still in, have you had any indication of how that is working this year? Is it working as you would expect or have the same problems that have perhaps shown up in previous winters where it does not appear to be working and flowing with price occurred again this year?
Mr Wright: This winter was a good test because we had record demand in the UK on a number of days. We also had that coinciding with some problems with the Norwegian North Sea supply. When that happened we did see a good response through the interconnector and, indeed, through the LNG import facilities. The interconnector responded to price as we would have expected, but I would not be over-relaxed about that because this is a year in which in general, as Alistair explained previously, there is a surplus of gas around Europe so if there is an opportunity to sell gas into the UK you would expect the European traders to take advantage of that. This year it worked well and the market responded well to the difficulties that we had during January, but if we had a situation where that coincided with a very tight supply and demand situation in Europe it might be different.

Q97 Mr Weir: You said earlier that some of the companies on the Continent had overbought gas in long-term contracts from Gazprom. What evidence is there that that is a reason that it is now coming into the UK, they are offloading it and at least getting some of their money back? Is that basically what has happened with the interconnector this year?
Mr Wright: We do not have any specific evidence, but generally we know from a number of sources, that being one of them, that Europe is well supplied with gas this year. Even during the cold weather it

was well supplied with gas, and that is largely a consequence of the impact of the recession and possibly energy efficiency. Certainly there was no problem in attracting gas into the UK. As soon as a price difference opened up and the UK needed the gas, the gas flowed through the interconnector.

Q98 Mr Weir: That being the case, why did the National Grid feel it necessary to issue warnings on the amount of gas that was available?
Mr Wright: The Gas Balancing Alert system is a way of signalling to the market that more gas is needed. We introduced a new change in the market this year which allowed Gas Balancing Alerts to be issued within day if there was a loss of supply. When National Grid learned that the Norwegian supplies were going to be reduced because of technical problems on the Norwegian fields they issued a Gas Balancing Alert which was a signal to bring gas into the market and that worked well, the gas did come in from other sources and the market did respond. This is not necessarily an indication that the market is not working, but an indication that there was a supply problem that needed to be addressed.

Q99 John Robertson: I want to continue from where Mike was going. Where do you get your information from in Europe in relation to these figures, or that you do not get?
Mr Wright: There has been a big increase in transparency as far as gas flows and particularly gas storage across Europe over the last few years and Ofgem has been a prime mover behind that. We have led the project to improve gas storage information and transparency in northwest Europe and we are now in a situation where the last major German company has agreed to provide gas storage information, so shortly we will have most gas storage covered by this. We see in the gas storage information there is additional information about flows through key import and export points such as the import into Germany and Holland. There is information out there. Also, there are a number of trade journals that we pick up from.

Q100 John Robertson: Your comment was that you do not have enough information.
Mr Wright: No, we do not have enough information, it is a slow move, but we are making progress and there is information out there.
Mr Buchanan: A lot of it is ex-post, and you might say that is a fat lot of good if we are having to worry about the fact that we have got a security of supply problem.

Q101 John Robertson: Will we have a better analysis of what has happened this winter than we have had in previous winters?
Mr Buchanan: Yes, I believe we will because of the information flows that are starting to come through.

Q102 John Robertson: That is great. In the report at 3.41 at the end you say: "Third party access to pipelines and storage can also be more difficult in other European gas markets than in GB". That sounds good for us. Later on you talk about divergence and arrangements for delivery for security of supply, which you have mentioned. At no point can I find in this document, and I have not really gone over this with a fine toothcomb, where you talk about the actual base load. You talk about gas in great detail, and I can understand why, and you talk about 2015 being a very important year and where we might be, but at no time do you talk about the base load and what happens if the wind does not blow, or have I just missed it?
Mr Marlee: One of the things we have said is that the issue on wind is going to become much more relevant the greater level of wind there is in the system. We have said that there is a question as to whether effectively there will be enough peaking capacity available under the current signals in relation to when the wind does not blow. We are basically saying that there are a range of different ways you can deal with that and that might be about allowing the price signals to be tightened if you are in a kind of Package A world to allow for those signals to be sent through for the peaking capacity to be there. Alternatively, you might say even if you tighten the signals that will not be enough and you may need to go and look down a kind of capacity tenders type situation.

Q103 John Robertson: Let us liken this to us getting supplies from the EU. Summer has more and more become an electricity usage area and it is almost peaking as much as in winter, although probably not this winter. If we have a hot summer, and countries in Europe are a lot hotter than we are, then our demand may not be met in this country and we will not be able to get anything from the EU. Has this been looked at?
Mr Buchanan: This is on gas supply?

Q104 John Robertson: Just in general terms of using the interconnector. I can see us coming under pressure.
Mr Marlee: One of the stress tests that we did was actually looking at, for whatever reason, it was such that electricity interconnectors were out-flowing consistently, and between the work that we did in October and the responses we got from the consultation that was actually one of the areas that gave us greater concern. I do not know if you remember our stress test traffic light system, but all of those traffic lights went red and, therefore, that is a concern to us. You then need to look behind why that might happen. Again, it comes back to are there reasons as to why the signals in GB would not be strong enough such that the interconnectors were flowing in effect in the most efficient direction, in which case that is something that might lead us to say we need to sharpen our signals to make sure that any distortions there might be in relation to our interconnection are dealt with in terms of GB price signals. The other way you can look at it is to say should we be saying is that sufficient, is it to do with maybe the public service obligations that there are in

European countries that are not going to be dealt with through things like the Third Package and, therefore, do we then need to go and look at some of those in relation to electricity as well as gas to say there might need to be some kind of security standard that the suppliers are obliged to meet through some kind of obligation.

Q105 Mr Anderson: Has any work been done on that? It would appear that we have not had any success in convincing the Europeans that they are wrong and we are right, but what we do know is effectively if it comes to the crunch they will get supplies and we will not.

Mr Wright: This is a really important area. It is important that whether we do it through the market or through obligations we have the right signals to make sure that the gas stays here when it is needed and does not just flow to whichever country has the strongest obligation and the strongest signals at the time of crisis. We need to make sure we get that right and that is an important priority. When we talk about the early actions, that is one of the key areas we want to move ahead sooner rather than later.

Paddy Tipping: We are using our time well but I am conscious we have only got about 15 minutes left. I want to focus on two areas that we have already talked about: first of all the price of carbon and, secondly, the importance of prices to customers. Could we start with the price of carbon.

Q106 Charles Hendry: The support mechanisms which are available, that we look at a levy for encouraging carbon capture and storage, that there are the ROCs and feed-in tariffs for renewables and other mechanisms out there, to what extent do they conflict with a price for carbon and the clear signal which that would give to the market?

Mr Buchanan: To a certain extent we have a price to carbon, arguably it is just not working the way anybody thought it would work, which is the EU ETS mechanism, where the price is very low and there are questions about the institution itself. In a way, the options taken to kick-start renewables and to kick-start carbon capture are in addition to what is in place already. Through our optionality from A to E we do address whether, in fact, by looking at the carbon issue it requires us to revisit the banding, for example, on the renewables and whether there is a two-handed approach. What it also clearly focuses in on is whether we need an additional instrument: do we need our own form of carbon tax. This is where we start to hit against, as indeed we might on the central energy purchaser model, European law and whether this is a legal thing to do. We do highlight that very much in our report. Incidentally, Sarkozy has been trying to do this in France but the Constitutional Court has blocked him from going down a French carbon tax route. We need to look at what is going on in a broader context across Europe as they are grappling with this issue as well. We have addressed the concept of whether we need a carbon tax. Is it doable? We do not know. We have not really developed purposefully what it might look like in detail. We have other instruments in place, but I do believe that those other instruments at the moment, if we look at the actions of the companies and the financiers, arguably are not going to be enough to provide the comfort for investors to come to the market.

Mr Wright: The only thing I want to add to that is if you cannot solve the issue about the strength of the signal to reduce carbon dioxide through the market then that does lead you more towards the right-hand side of our chart and the more interventionist options where you tend to mandate the amount of low carbon generation you need because otherwise it is difficult to see how enough low carbon generation will be delivered through market mechanisms.

Q107 Charles Hendry: If we look particularly at the funding of renewables, the ROC system appears to be favoured by the existing operators, the feed-in tariffs appear to be favoured by investors, and there are some who argue for subsidies to encourage research and development within a more level playing field after that. Do you have a preference for how that mix should be operated? How do we avoid conflicting and confusing signals being given to investors because of the range of different schemes which could be out there?

Mr Buchanan: The Government has, quite rightly, the central policy lead here. They are trying to ensure that we hit these renewable and carbon targets with a particular focus on getting that 33GW of renewables by 2020 and, therefore, the Government is aligning a range of almost jump leads on to the system to try and ensure we get there. Whilst we, like many of you, have an involvement in advising the Government before they come to a decision, once their decision is made and that is the way they believe public policy is going to drive our carbon renewable targets then, candidly, we get on with it. In most of these areas we have part of our business called Ofgem E-Serve and we run them. We do not have the policy lead for them but we run them and we seek to do that as effectively as we can.

Q108 Sir Robert Smith: If we go down trying to incentivise low carbon by any other mechanism than the emission trading across Europe, is not the reality then that either the British consumer or the British taxpayer is subsidising the rest of Europe because any UK-only mechanism will obviously reduce the demand for permits, which will reduce the price which will make it easier for other European emitters to buy the permits at a lower price and make it easier for their economies? Have we got ourselves as with the mismatch on markets with the Emission Trading Scheme? By signing up to it, is that not the one we have got to make work?

Mr Buchanan: That is a really good point, but to some extent that is the consequence of the UK seeking to deliver carbon emission reductions within its own borders. If you move away from that and you say that it is okay not to reduce emissions within our own borders and just buy up the cheap allowances from everybody else, then you can benefit from that dynamic in other countries, but if you have a policy decision that says you are aiming, for whatever reason, to reduce carbon emissions within your own borders then I think that is an inevitable consequence of doing that within the framework of a European-wide scheme. It is an important question and one that ought to have some consideration.

Q109 Dr Turner: I was interested in your comment to the effect that if all else is failing, if market signals, et cetera, are not working, Government might be forced to mandate renewable investment, for instance. That still does not get round the question as to where the investment capital is coming from. How would you address that?

Mr Buchanan: It is a very interesting question because outside of the Big 6 and one or two other major utilities in Europe—DONG, the Danes, Vattenfall, the Swedes—clearly interested in the renewables sector, I think it is a very substantial challenge. There is money from smaller players or funds available, but that money, not surprisingly, is following generally the subsidised regulated area, the neo-regulated area of onshore. Outside of that you have got grants from the EIB. You have got small grants from Partnership UK and the Treasury. I think it is a great question. You then say, "Well, where are the funds going to come from other than the group of companies who we either like or loathe", but other than that group of companies and the investors that naturally are investing through them, is it the oil majors? They do not appear to be very interested. In fact, BP, a couple of weeks ago Tony Hayward was fairly succinct in his comments on the UK, not particularly appreciating the offshore wind, nuclear approach. We do not see the majors coming into this area yet. Some have argued that some of the major American utilities, which by and large tend to be much smaller than European utilities, would come into this space. US utilities have their own issues. Particularly if it is a nuclear power station, let us say, they have their own nuclear grants. In many instances the key nuclear operators in America are operating in fully regulated environments, so they are going to get a regulated return. It does not appear that is going to be where money potentially comes from. Of course, American investors, having worked there myself in the 1990s, have got very long memories about the US utilities that came to Britain in the mid-1990s and went back again by and large with their tail between their legs. That leads you to say either the money is going to come potentially through the big utilities and their investors, and that is not just necessarily the big utilities with us now, as I mentioned DONG, Vattenfall, maybe Gaz de France, Suez, some of the big players within Europe, but that is the definition, and/or it is going to come through another vehicle. This is what I believe the Treasury and DECC will have available to them in drawing up their 2050 roadmap and their energy market arrangements paper, which is what is that other vehicle, what does that vehicle look like, because if we get that vehicle right then that could have quite a substantial impact on how much change we have to make to the energy market structures. That vehicle could range from some form of Green Bank, some form of trust mechanism, some form of public-private. Those are areas—they once were my expertise because I was in the markets for nearly 20 years—currently outwith my expertise, but I know Government are receiving advice in that area.

Q110 Anne Main: The poor old customer has come out very badly in a lot of the concerns over energy pricing and in a lot of your scenarios and things you have revealed today, it appears to be if there is any shortfall in money the consumer may well be picking up the bill. Could you give us any indication of which would be the best package that you are suggesting for consumers?

Mr Marlee: To be honest, there is actually not an easy answer to that question. In some ways what we are indicating in this report is we think that consumers will benefit most by us making sure that we have got the right framework in place now and not leaving things too late, in which case we think that you might have a higher cost to deal with those issues once they arise if we have not got the framework right over the next three to four years.

Q111 Anne Main: So in plain speaking you are saying that the consumer is going to pick up the bill and it is better to pay it now than a bigger bill later?

Mr Marlee: We are basically saying that it is certainly better to make sure that effectively if you take action now that is cheaper than taking action in the future, we should be taking that action now.

Q112 Anne Main: Is "taking action" that they pay now upfront to ensure that you have the investment that you need, to guarantee it for you because you may not be able to get that investment elsewhere? Is that what you are saying?

Mr Marlee: I think what we are saying is that effectively it may be the case that if there are problems that arise in five or six years' time then the way to deal with them then might be to take more expensive solutions than you might have otherwise done if you had got the framework right. That is what we are trying to do in terms of getting the framework right. All of our scenarios did show price increases between now and 2020. They ranged anywhere from about 13 per cent increases to 26 per cent. A lot of that, certainly in the green scenarios, was due to the fact that there is this investment needed and those costs were likely to fall to consumers. It is important to note that those prices rose even in the scenarios where that investment was not made. In cases where that investment is not made then consumers are left more exposed to the kind of commodity price variability that is there if you have not invested in some of the lower marginal cost renewable nuclear generation. In other words, in all of our scenarios there were price increases shown.

Q113 Anne Main: In all of your scenarios there were price increases, but from what you have just said, and you are saying it is a very inexact science, it would appear to me that you cannot really be accurate to have a lower price increase and it may indicate that looking at the worst case scenario may be more realistic for the poor old consumer.
Mr Buchanan: It might. If I may link your question to Dr Turner's, I think I am trying to answer your question with regard to who pays today and should today be the moment that you pay and how do you handle that.

Q114 Anne Main: Yes, but also who is protecting the consumer in all of this? Which consumer is footing the bill? Are you frontloading it to protect yourselves or are we protecting the consumer and trying to be cautious all the way through?
Mr Buchanan: In what we are trying to do we are trying to protect the consumer because the thing that we fear most on behalf of the consumer, which is our primary job, is that we get to a period in four or five years' time where prices are going up sharply because we have a shortage and potentially we do not have the solutions that we have put forward and others are putting forward, and then you get high volatility and great uncertainty for the consumer, very high price, and a degree of uncertainty in the market that affects both consumer and investor. This is no doubt something that Government will be looking at, but one of the issues to address is, given all of our four scenarios show higher prices going forward, is there going to be a requirement on the financing side as a potential solution, and I am not saying it is one I am commending, that, for example, if you were to put £2 a megawatt hour on a roughly £40–£50 megawatt hour bill today and you put it there for 30 years, you have created a fighting fund of about £10 billion securitisation which you can then raise debt off the back of, because that is consumers' money, to say, "There is a substantial sum of money here that we can use to invest in GB plc".

Q115 Anne Main: Do you favour that?
Mr Buchanan: Then you have got to make sure that you have got a return for the consumer out of that.

Q116 Anne Main: You are painting a scenario. Would you favour that?
Mr Buchanan: It is an option. It depends on how you want to balance the financing options with the market structure options.

Q117 Anne Main: Which would best serve the consumer?
Mr Buchanan: Unfortunately I do not have all that information in front of me, but clearly the Department and the Treasury will to be able to come down to that kind of conclusion.

Q118 Judy Mallaber: You have made it clear in a number of comments and in the report that quite apart from the issue that Anne was raising of the critical importance of the impact on the consumer, which we are concerned about, that higher costs of gas and electricity is going to make it difficult for consumers to be able to afford and that will have an impact on businesses, investment and our future programming for having proper energy supplies in the future. Surely you must be able to give us some indication of which of your various policy packages is likely to lead to the lowest price increases and which is likely to lead to the highest increases, and which is the riskiest or least risky of those packages?
Mr Wright: There are two factors you need to take into account in making that judgment. The more you mandate a solution then the lower the cost might be to attract the finance into the industry and to fund that investment, but at the same time the more you go towards a mandated solution the more you sacrifice the potential benefits of competition which might lead to lower prices because of greater efficiency or greater innovation. Those are the trade-offs. If you get ten economists in a room you will probably get ten different answers about which is the best of those outcomes. Those are the judgments that need to be made in assessing whether or not a certain outcome produces lower costs for consumers. The underlying facts of £200 billion of investment increasing and volatile international commodity markets for gas and oil are unchanging and it is a question of what is the most effective way of dealing with that.
Mr Buchanan: On the right-hand of our options, option E, it talks about a central energy purchaser and there is a very interesting debate that has to be had, and quite clearly this is Government's call, which is by having a degree of mandated and prescribed solution does the cost of capital go down for the players involved, and therefore consumers benefit, or is the fact that a mandated solution is always weaker than a market-based solution the offset? What is best for the consumer? Is it because you create a stable solution and, therefore, you can have a lower cost of capital because you can raise debt as a company and that flows its way through the consumer, or is it an institution or a regulator will never set the price as well as a market and consumers will lose out on price? That debate is an absolutely integral part of the broader debate we are having here.

Q119 Judy Mallaber: Are you able to in any way plot us any graphs for each of the five packages and the different options you are talking about, because if you are not able to do that I am not quite clear how Government is easily going to be able to reach decisions on which path we should go down?
Mr Buchanan: What we have been able to do is plot through the scenarios the price range difference. Quite clearly, therefore, it is going to depend on what the Government feels is the appropriate scenario of the future that is going to determine the scale of the price increase. In looking at that scale of the price increase, they will then look at the various solutions which may be part structural, as we have offered on our A to E, and part financial, which are outwith our input. Government will be able to answer that

question where we are hesitating at the moment because in a way we have come as far as we can in our analysis and our analysis on pricing.

Q120 Paddy Tipping: I know all my colleagues want to pursue this.
Mr Buchanan: We are very happy to. I am sorry that we have slightly curtailed today.

Q121 Paddy Tipping: I gave you a firm commitment that you would be away at ten, so we would be very grateful and we will try and fix something else to take this forward. Just let me ask you finally, you have mentioned the Government a time or two and you have produced an interesting report which suggest that price reduction in the wholesale market have not been passed on to customers. All the big energy companies are going to report their finances very shortly and the speculation is that British Gas will have a profit of £800 million, £900 million and the other companies will be, as they put it in my part of the country, "quids in". They are not doing themselves any good, are they, if they do not pass savings on to customers?
Mr Buchanan: You are right to think the companies are being very foolish if they do not recognise their consumers. In our report we said that the action of British Gas broadly had led the overall price projection to be lower than we had thought in December. One would hope that the commercial instincts that we are seeing in the marketplace—price drops certainly from one of the companies, we are seeing active switching still, we have now got new rules in place in the last two months over doorstep selling and the small and medium-sized contracts that needed cleaning up—are going to lead to companies very much recognising their responsibility to consumers. It would be extremely foolish of them to take advantage of this broader debate that we are having to short-change their consumers.
Paddy Tipping: We will finish on that very strong point. Thank you all very much indeed.

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