HOUSE OF COMMONS

Welsh Affairs Committee

Oral evidence: Energy generation in Wales: Shale Gas, HC 731

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Written evidence from witnesses:

- Department of Energy and Climate Change

Watch the meeting

Members present: David T. C. Davies (Chair); Glyn Davies; Jonathan Edwards; Nia Griffith; Simon Hart; Jessica Morden; Mr Mark Williams

Questions 221-294

Witness: **Chris Faulkner**, Chief Executive Officer, Breitling Energy Companies, gave evidence**.**

Q221 Chair: Mr Faulkner, you and I have met before and had a discussion about shale, but I am not sure that you have met everyone else on the Committee. First, thank you very much for coming along here this morning. Would you like quickly to introduce yourself and to tell us what you do? I will then ask Mark Williams to start with a few questions.

Chris Faulkner: Absolutely, and thanks for the invitation. My name is Chris Faulkner. I am the CEO of Breitling Energy. We are now in our 10th year in the United States of onshore, lower 48 states, unconventional oil and gas development, utilising hydraulic fracture stimulation. Over those 10 years, the company has switched from natural gas to liquids, as the United States has made the transition towards what we call light tight oil production. As shale gas production in the United States has reached a 100 year-plus supply, it is very difficult in the US currently to produce gas economically at the price point, down from $15 to $4, so as a company now we are using fracture stimulation to generate oil production.

Chair: That is excellent. I hope you will not mind my saying this, but most of us here are not technical animals.

Chris Faulkner: Okay. Shall we start over?

Chair: You may need to imagine you are explaining it to somebody who does not have a scientific background.

Chris Faulkner: Understood.

Chair: That is great. Let me ask Mark Williams to come in.

Q222 Mr Williams: I am very glad the Chair said that; I reiterate that important message about the layman. You have mentioned the history of your company, but could you outline briefly the history of the development of the shale gas industry in the US and how important a source of energy it is for the US?

Chris Faulkner: The terminology they use now in the media is that there is a shale gas revolution. I would caution against using the term "revolution" unless it is predicated by the term "evolution", because about 20 years' worth of development work went into understanding how to unlock this trapped hydrocarbon in very tight rock known as shale.

The real turning point in all of this was some time after the turn of the century, before 2005. What happened was a combination of two pre-existing technologies. One was horizontal drilling, going sideways through the rock and being able to steer the drill bit, and combining that with a technique that had been utilised for almost 80 years in the United States called hydraulic fracture stimulation, now known as fracking. The original test was done in an area where I currently live—the Barnett shale, in Fort Worth, Texas—by a man by the name of George Mitchell. The Mitchell Energy company took those two techniques, combined them and—lo and behold—unlocked what is now considered to be the biggest potential shale natural gas basin on the planet, right in Dallas, Fort Worth.

In 2005 the United States was still forecast to be a major, major importer of natural gas, the biggest on the planet—about 56 trillion cubic feet every single year. Excuse me—it was 56 billion cubic feet—bcf; I was thinking about you guys using three and a half. That import forecast was done by the very smartest economists we had. They had a similar forecast until 2009. At the same time, what they did not comprehend was the impact of the industry's development of shale gas. By 2009 those forecasts had dropped to very near to zero, and the United States has subsequently become a net exporter of distillate fuels and, potentially, natural gas. It is now on the eve of being an LNG exporter.

The reality is that, within half a decade, it turned our environment of energy up on its ear. Now we have about 100-plus years' worth of supply on the conservative side. Some guys in the industry say 200 years, but I always stick with the conservative number of one century's worth of natural gas supply.

Q223 Chair: What would it have been before?

Chris Faulkner: It would have been none—we would have been an importer. We built these terminals to import gas from Qatar, similar to what you guys do today. We were going to be an importer, and they were going to be an exporter to us, but those terminals never got off the ground because they were built during the same time as we became a massive natural gas producer. Today those terminals are being converted to export, as we are on the eve of becoming an exporter of natural gas. In our country now, it has reduced the cost of electricity, has allowed us to lower our greenhouse gas emissions by displacing coal and has given us an opportunity to switch a lot of our transportation on the large fleet side to natural gas. So there are a lot of benefits coming from this domestic natural gas boom.

Q224 Mr Williams: The prime motivation behind this inquiry is the impact that this has on Wales and, perhaps more generally, on the UK's energy needs. We have heard evidence that tens of thousands of wells would be required in order to drill economically for shale gas in the UK. What is your experience of those kinds of figures—tens of thousands of wells—in the US?

Chris Faulkner: I would be cautious. You do not have to mimic the success of the United States, to the degree that, as we speak today, we have 1,750 drilling rigs running in the United States, with the majority now drilling for—let us just call it—oil. As a whole, there are 1,750 rigs running in the US. We have drilled 150,000 unconventional shale gas or tight oil wells—a tremendous amount—but we have to take into consideration that technology has now pushed this industry further along, so we are able to do more with less. I think there have been 40 wells drilled over here in total. Obviously, something lower than tens of thousands and higher than 40 is going to be the number by which we can establish commercial production.

As you know, the reason we have had to drill that many wells is that the wells decline very rapidly. In layperson's terms, when the fracture stimulation occurs, the rock is cracked open and little beads—let us call them sand or ceramic pebbles; they are very small—go into the earth. The pressure is released and the earth closes up, but it now has very tiny fissures by which gas can escape and go into the wellbore. Because of the pressures and the weight of the earth, it pushes on those and they close back up and begin hyperbolically to decline, so you lose the majority of the production after the third year. What we have realised now as a country is that there is a massive amount of gas that still comes—what we call the tail of that production—so that once it declines it extends for a very long period of time, say, 20 years.

As an industry, we are trying to grow our production exponentially; keeping production flat and growing production are two different stories. A tremendous number of wells will have to be drilled, but that does not mean that one well is drilled off one pad and you move down the road. We can now drill 24 or 30 wells from one single five-acre pad site. We do not have to keep moving the rig any more.

Q225 Mr Williams: You have predicted my next question, which is about the five-acre pad. What effect does population density have on the capacity to drill in any given area? Population density in the UK is very different from what it is in parts of the US. What kind of challenges does that present?

Chris Faulkner: We can look at an example from the Barnett shale. The Barnett sits beneath a very large metropolitan city—Dallas and Fort Worth, Texas. With directional drilling, we can drill from 3,000 metres away in any particular direction, so I would not say that we have to set a rig in the middle of a dense area. There are areas we can drill from and directionally to, in multiple different directions.

We have drilled under the university of Texas at Arlington, underneath downtown Fort Worth and underneath hospitals and schools. DFW airport signed one of the largest royalty programmes—they are not contracts—with Chesapeake, which drills underneath runways and terminals in an area where obviously safety is very important. You cannot

think of it like in the old days, when you would set up the rig and drill straight beneath it. The reality is that technology now allows us to reach very distant areas.

Q226 Mr Williams: The caricature that some of us have in our mind is that it is a vertical drilling exercise.

Chris Faulkner: That is how this was all done until, basically, half a decade ago. We still drill vertical wells in the United States, in the Permian basin, but most of them are now directional or horizontally drilled. Keep in mind that, with what we call measurement while drilling or MWD, or logging while drilling or LWD, you can steer these wellbores almost like a worm, so you can directionally steer them any way that you want. The technology has really pushed this forward. I would not use population density as a crutch to stymie the development of shale gas.

Q227 Chair: Mr Faulkner, everyone wants to ask you a question on this. We have a Minister, Mr Fallon, coming in at 10 o'clock, so we may have to be a bit more concise, if possible.

Chris Faulkner: Understood.

Q228 Nia Griffith: I am particularly interested in what you said about the drop in the price of gas. Can you give us more precise information? Can you tell us what percentage of US gas now comes from fracking that did not come from fracking before? When you talk about the effect on the price, can you explain exactly how that has happened? Obviously there are a lot of factors that play into this.

Chris Faulkner: In five years' time, basically—

Nia Griffith: No—up till now.

Chris Faulkner: Okay. Let us start in 2005, which we consider the tipping point of development in the United States. In the last seven years, we have been able to get almost 50%—46% today, going to 60% by the end of this decade—of our natural gas from shale and fracking, up from almost zero.

Q229 Nia Griffith: You are saying that 40% of the supply of US gas—

Chris Faulkner: From zero to 46% today.

Q230 Nia Griffith: Where did that come from before?

Chris Faulkner: Imports.

Q231 Nia Griffith: So you have switched from imports; 40% of what you now consume used to come from imports and now comes from—

Chris Faulkner: Shale.

Q232 Nia Griffith: You have been running a very, very large operation.

Chris Faulkner: Yes. I think that is indicative of the fact that in our country there are 1,700-plus drilling rigs running onshore, whereas there is a fraction of that in all of Europe. In all of Latin America, which is the next biggest area, there are 400 rigs running. Keep in mind that a sheer massive amount of investment capital and work are being done to get to those numbers, but we have driven the price down from a height of $15 to a low of $1.76; today it is about $4.20. It will come back down after the winter, when it warms back up.

Q233 Nia Griffith: That is with 1,700 rigs.

Chris Faulkner: Correct. I am not here to paint a scenario that there will be 1,700 rigs running in the United Kingdom—or in all of Europe, for that matter. I do not know whether that is possible. It is hard to comprehend this, but there is a finite number of rigs on this planet, and they will be running in lots of different areas. We are competing for the availability of those rigs.

Q234 Nia Griffith: Effectively, what you have said is that you went from 0% provided by the US to 40%. We have a slightly different situation, because we have provided gas from within the UK before.

Chris Faulkner: Correct.

Q235 Nia Griffith: Do you have any idea what sort of percentage of our gas supply might come from some sort of fracking?

Chris Faulkner: In what time frame?

Nia Griffith: You tell me.

Chris Faulkner: The development cycle of this resource from start to finish is about 10 years. In most countries in what I call frontier play—areas such as the United Kingdom, where very little development of shale is taking place—it is about a 10-year cycle from when the process starts until commercial production is reached. The reality is that the Bowland basin contains 1,300 tcf-worth of gas. Everyone says that those numbers could be exaggerated, so let us cut them in half, to 600. If we can take just 10% of 600, that on its own would fully supply the United Kingdom with 25 years' worth of its gas needs.

Q236 Chair: And that is just one shale area.

Chris Faulkner: That is just one area—basically, around Blackpool. It does not count north or south Wales or Sussex. The resource in that one area is multiple decades' worth of natural gas supply for all of the United Kingdom.

How long would it take to develop that? It depends on regulation and the amount of investment capital, whether a competitive enterprise and market can be established, and whether companies feel secure that they can invest the amount of money that has to be

invested in one of these particular resources. The well cost here is twice that in the United States because there is not much of a competitive market. That will come down as the market develops. To get that to come down, someone has to step up to the plate and put a lot of money into the ground. The challenge is creating an environment where companies feel safe to do that. That is where the United Kingdom is at a tipping point now—to make that regulation framework work for the people and for enterprise.

Q237 Nia Griffith: Can I follow up on that? What would be your attitude to the idea of tax breaks? What sort of tax breaks do you think would be needed to incentivise this type of development?

Chris Faulkner: I have been all over the world, and you guys are really the first country that has been able to apply some sort of incentive for the communities. I said from the start that there were a lot of things that created the perfect storm in America as to why this works, but the biggest thing is that the communities and the people are involved through royalty programmes or payouts; they receive a part of the production. They certainly receive more than 1% and £100,000 per well, but the reality is that most other countries around the planet have not established any sort of incentive programme, tax break or subsidy for the companies and/or the communities.

It is very important to have buy-in from the communities. I know that they do not own the minerals; within the United States it is a very unique situation. But those communities have to see some kind of prosperity from the development of these assets, or they have no reason to be a part of the conversation. They will be part of the conversation—but on the other side.

Q238 Jonathan Edwards: As an American, what you do think the geopolitical considerations are, now that you do not have to import so much gas, especially for those states around the world that will be increasingly reliant on gas and oil resources from the middle east and Arabia? Essentially, the US pursued a very aggressive foreign policy to make sure the taps were not turned off. Will it be so engaged in future?

Chris Faulkner: There are two things. First, I think the geopolitical concerns or impacts are widespread. The bigger issue is that America has finally decided that there is a massive opportunity to really embrace energy security. I'll tell you that, as a country, we never had a domestic energy policy, because we always considered ourselves an importer. For the first time, there are now conversations about the impacts and benefits of an energy security policy for the United States.

I would love to tell you that the United States can stop doing energy for security deals and stop policing the strait of Hormuz—and the strait of Malacca, for China. The reality is that I think we will always have a presence there because China has a vested interest in our country, and vice versa. I do not know whether you have watched this, but there have already been discussions between President Obama and the new Chinese President about the need for the United States to keep a presence in the middle east. China is also beginning to build pipelines. The one in Turkmenistan is a great example of a pipeline coming in to China. It is 6,000 metres long. They are piping in production of oil and gas

now because they are afraid that the strait of Malacca, which 80% of their oil comes through currently, will no longer be policed by the United States.

I would love that to happen so we could save all that money. I do not know whether it is ever going to happen, but if we become energy-independent on oil—which we will do—what will that mean for the United States? It is obviously a big mental shift from the middle east and OPEC; I think it makes them less relevant. The middle east—especially Saudi Arabia—obviously has concerns that its biggest customer is going away and it now has to marry itself to China and/or India to sell product. There are wild cards such as Libya, Iran and Iraq. Iran said just last week that it would sell oil for $20 a barrel; it does not care what OPEC wants.

What it is doing is not creating an oil island but making the North American countries—Canada, Mexico and the United States—their own mini-OPEC, if you will, and making the rest of the world have to contend with the middle east. The wild card here is Gazprom and how we continue to have a relationship with it. China tried to get it to give discounts, but it would not. Will China try that with the middle east? I do not know. For the first time in 70 years, we in America are on the road to having some kind of energy security, which 10 years ago we never thought possible.

Q239 Jonathan Edwards: How skilled are the jobs in the industry in the States? What sort of salaries are we talking about for those who work in it?

Chris Faulkner: There were 2.1 million jobs created from unconventional oil and gas development. The industry supports 9.8 million jobs today, with another million jobs by the end of this decade, potentially. They are some of the highest-paid jobs in the United States. If you go to North Dakota, you are looking at a bubble economy created by oil and gas. It has less than 2% unemployment. The average wage there is above US $130,000 a year. That bubble economy was created by oil and gas—

Q240 Chair: In the shale gas industry?

Chris Faulkner: Yes. That is where the majority of jobs now are. These were sleepy little towns and now they have blossomed.

Q241 Chair: What does an unskilled labourer earn? I am talking about somebody without a degree from a university, who is doing some kind of labouring job.

Chris Faulkner: They may not have a degree, but these are very hard, complicated jobs out in the weather—especially in North Dakota, where it is negative 20-something degrees sometimes. These guys make very healthy wages—way above market for doing these jobs. That has created the ability for folks who had less opportunity to have opportunity at a greater level. More importantly, people from all over the United States have moved to these areas to get jobs because, as you know, as in Europe, we have had an economic meltdown. It has been this tail wind to help us at least to pull out of what was initially a recession.

To take that one step further and then we can move on, companies in energy-intensive industry—manufacturing with a feedstock of natural gas—are now moving to the United States for the first time. The EIA released the energy outlook report yesterday. One of the

underlying themes, which the media are finally starting to take hold of, is that $71 billion in industrial plants in the United States are being built, have been permitted or are being discussed to be invested in. There are the jobs that come along with that and the plants that are moving back.

It is the first time in a while that we have seen insourcing back into the United States, and they are citing very clearly cheap and abundant natural gas. When you look at places like Grangemouth, INEOS and those big factories that employ 170,000 or 175,000 people, the idea that we have natural gas at a third—if not less—of what you guys have, and a fourth of what Asia has, creates an opportunity in America for us to be a black hole to pull industry back to our country, because, out of the gate, we make industry more competitive with the abundance of natural gas.

Q242 Jessica Morden: Moving on to the impact on local communities, can you describe the kind of disruption a community might experience from drilling?

Chris Faulkner: If you are not using pad drilling—if you are putting up one well site, drilling one horizontal well and having to move on to the next location, as we have had to do in America, because we have policies in which we have to hold the acreage for landowners by drilling a well—it takes 1,000 trucks in and 1,000 trucks out to mobilise and demobilise a rig, with the water, the flowback and all of that, so there are a lot of trucks. That reduces significantly if you do not have to move the rig because you are pad drilling.

Things that concern communities are noise, dust and truck traffic on roads. Obviously, the elephant in the room is that their local water will be contaminated by fracking, because of the undertones of the environmentalist movement that are already occurring in the United Kingdom. Those are the biggest concerns.

If we wipe away the fact that we feel very confident that fracking is safe, there will still be concerns about noise, dust and truck traffic. To reduce those, we use pad drilling. We use sound and noise actuators. Curtains that go around the drill site keep the viewshed intact, for the aesthetics, and also keep the noise down, because you are drilling 24 hours a day in these communities. There are ways to limit that, but those will be the initial concerns. In a lot of these areas, the roads are not phenomenal. In certain areas that I have visited, there will be concerns about having haulage trucks on them.

Q243 Jessica Morden: So they are really quite big impacts for the sleepy towns you mentioned earlier. Over the weekend, for instance, there was an article off the back of our autumn statement and the Chancellor's announcement that described the impact on a town in Texas, where people talked about nausea, nosebleeds, getting asthma, drilling noise and slumping property prices. Would you like to comment on that?

Chris Faulkner: Are you talking about Dish, Texas? Do you know the name of the town?

Q244 Jessica Morden: I do not know. It is just that there is a lot of drilling in Texas, isn't there?

Chris Faulkner: There certainly is. There is a very famous town in Texas called Dish. The mayor went on the record, moved his family and said that it was a house of horrors and it looked like all these things were occurring. The EPA came in and did all these studies. It could not find any correlation with fracking, although the mayor is convinced that it was due to fracking.

I am not going to say that he is right or wrong; I will just go by what science says. The reality is that we use vapour recovery units to capture methane emissions, which is what people talk about around these drill sites. Our production has gone up by 40%, and our methane emissions have gone down by 20% at the same time, so obviously progress is being made utilising technology. The biggest complaints that I get personally—I do not know whether I am speaking for the entire industry—are about noise and sound. We take sound readings around our drill locations. If you are up on top of a drilling location, it is not even a quarter of the sound from living near an airport.

Q245 Jessica Morden: It is a relatively new technology, though, so some of these issues may not come up—

Chris Faulkner: I disagree that it is a new technology—we first used it in 1947.

Q246 Jessica Morden: But on this scale.

Chris Faulkner: To this level, yes, it is new technology. In 1947 we used napalm instead of water and chemicals. That is not to make a joke of it, but I think the technology has come a long way and 1.5 million wells have been fracked. Keep that in mind—this is not untested and untried. We have fracked over a million wells.

Q247 Jessica Morden: Have there been cases where energy companies have compensated residents for damage to health and property?

Chris Faulkner: The case that comes to mind was up in Dimock, Pennsylvania, where initially Cabot Oil and Gas was charged with groundwater spill—contaminated groundwater at the surface. It was later cleared of that, after they realised that a lot of this was from naturally occurring methane in the ground and not from hydraulic fracture stimulation.

With that said, I as a company have never compensated anyone for damage to their property, health, animals or anything like that. I will not say that I am speaking for everyone in the room, but I do not know of any large-scale instances where that has occurred. Keep in mind that America is a very litigious country. If somebody was damaged, I can assure you that they would be suing. I do not believe in the idea that there are large, widespread non-disclosure agreements, as the environmentalists say, that have been signed and forced on people.

Q248 Jessica Morden: But there have been cases of fracking water being discharged—

Chris Faulkner: At surface.

Q249 Jessica Morden: Isn't there waste water in the Pennsylvania—

Chris Faulkner: Flowback. I will tell you the key to this whole thing. It is not an argument about whether the process of fracking is safe or whether the procedure is safe. The reality is that it boils down to one single thing—wellbore integrity and regulation. If you drill a good well, have good cement and have regulation to monitor the water off as you are drilling, there is no issue with the process.

Keep in mind that whether you frack the well or not, you still drill through the water aquifer. There is a long history of development of energy resources in the United Kingdom. Whether you are fracking or not, you are still drilling through the aquifer—you still have to protect the aquifer from drilling mud and from hydrocarbon coming back out of the ground. We have done that now for half a century and beyond. The idea of fracking has been created because people were scared of natural gas, not because of fracking, which is the vehicle to unlock natural gas. Fracking is the bogeyman they have created.

However, I agree wholeheartedly. I live on top of the Barnett shale. There are wells drilled in and around my home. I drink the water every day. I do not feel one percentage of concern that this process is flawed or that it causes groundwater contamination. Now, if that means you go up on the surface, you spill stuff all over the surface and don't clean it up properly, sure, absolutely, mistakes happen. There is no non-consequential form of energy on this planet. If humans are involved, mistakes can happen. That does not mean it is flawed, but a mistake can happen.

Q250 Jessica Morden: The film "Gasland" had quite a negative impact on public opinion in America. Could that stop the development of the shale gas industry here? What is your view of the film?

Chair: What about this gas coming out of taps?

Chris Faulkner: The image of gas coming out of taps has become the image of fracking. The reality is that, if you research the Colorado Oil and Gas Conservation Commission, it will disprove that theory. "Gasland" came out in 2008. Since the '30s in that area reports have been filed with the water department that people can light their taps on fire. Kids in schools used to light the water faucet on fire, long before fracking was ever utilised. The reality is that it occurs from naturally occurring methane—what we call biogenic methane—in the water. That occurs in the United Kingdom as well. There are natural shale deposits of methane, which can migrate to the surface and get into a water aquifer.

Two things happened with that image. First, Josh Fox failed to mention the fact that there was a history of being able to do that. He failed to mention that it was from biogenic methane, not fracking. He also failed to mention that that landowner had drilled the water well way too deep, way beneath what was the permitted depth of about 650 feet. He drilled to darn near 1,000 feet and came into connection with the pockets of methane. So I would not go back and say that it has to do with fracking. George Washington lit the river in New Jersey on fire when he was President, and I do not think he was out there promoting fracking. But it has become a very powerful image—there is no question about that.

Q251 Simon Hart: Going back to the impact on the community, as you will know, there is quite a row in the UK about the impact of wind farms and turbines, which come, in a sense, with no even minor health or environmental downside, yet this has been one of the most contentious issues in Britain for a few years. Likewise, the creation of a railway, HS2, from London to the north is causing immense community upheaval, even if there is no risk to health, although there may be a risk to property value and the landscape. To what extent is it fair to make comparisons between wide open spaces in Australia, Pennsylvania, Kazakhstan or wherever it might be, and a much more densely populated UK?

The reason I ask that question is this. It was put to us that to frack the south of England effectively may require the creation of up to 1,000 wells. The south of England is a very broad description, but is that an outrageously over-exaggerated claim?

Chris Faulkner: No, it is not, but it is also a claim that with 33 drilling locations we could frack 1,000 wells. It is not 1,000 drill sites, as they would like you to believe—it is 1,000 wells drilled from a number of distinct locations. You mentioned renewables and such. I will tell you that I am not of the mindset that this will be an all-or-nothing proposition. I am a sort of middle-of-the-road guy who will tell you that because of this planet and where it is going we are going to need all forms of energy, including efficiency. Renewables will be a part of that mix. I am not going to sit here and tell you that shale gas will fix all your problems and you will never need anything else—you are going to need it all.

Q252 Simon Hart: I accept that, but let us leave public money to one side and assume this is private investment. You are aware of the scale of regulatory burden in the UK—the opportunity for people judicially to review decisions and to slow down the process. We find it with some of our own power stations and energy production in west Wales, where I live. Those delays, while they may have been forlorn in their intention, have resulted in significant cost implications to companies, to the extent that they are saying, "I can get my money back in five years in Germany, and it takes 10 in England, Wales or Britain. Why would I want to invest in that country, with the regulatory burden as it is?" Does that not apply to your industry, too?

Chris Faulkner: It does. When I was speaking with you, I talked about creating an environment by setting regulation and then allowing competition to generate a private, competitive industry. The missing piece is that companies have to understand what they are on the hook for. This whole moving target of regulation scares people. This is not something where someone will come and invest $10 million. If we are going to drill 1,000 wells in the United Kingdom, at a cost of probably $10 million or more per well, you are talking about $1 billion that will be invested—and that is on the low side. Most of these plays take $500 million to $5 billion to develop to commercial production.

We have to create an environment where regulation protects citizens and protects industry, it is laid out clearly so they understand that, and they can then feel comfortable about investing the money. The reality is that you have two roads to go down: an opportunity to create domestic supply that helps supplement or diversify the other supplies coming into the country; or an opportunity to continue to be a massive importer of oil and gas and to ignore the resource beneath your feet. There is also the potential opportunity that the gas

gets cut off and that this winter becomes a challenge for some folks. Last year we came within six hours of that happening.

I also caution you that—as I am sure many of you in this room know—Qatargas and Centrica have a contract that has no exclusivity to it and Qatar can ship cargoes of LNG to anywhere it wants, to the highest bidder. It has done so this year; 34% less cargo has come into the United Kingdom and has gone to Asia, because they are paying more than you guys and will continue to do so.

I think we have a responsibility to address those things. I can come here and talk to you until I am blue in the face and tell you how great all this fracking is and how great it has been for the United States, and I can tell you that you could develop a resource, but I cannot bring the resource. You have a huge resource. The responsibility as a country is for us to find some way of moving forward with it. That does not mean that windmills and solar are going away. I believe they feel that is the case—that it is us or them. The reality is that all of us have to come together if we are going to have a sustainable economy.

Chair: I will bring in Nia Griffiths now. We may end up having to cut this a bit short.

Q253 Nia Griffith: Is there a distance away from a property that you have to leave before you can have a well?

Chris Faulkner: It varies in the United States, but absolutely, yes.

Q254 Nia Griffith: So different states have different rules.

Chris Faulkner: Yes. Regulation is all state by state. There is no federal regulation of our industry, so it changes by state.

Q255 Nia Griffith: What sort of amount?

Chris Faulkner: Offset may be sometimes 500 to 750 feet.

Q256 Nia Griffith: Feet—not metres.

Chris Faulkner: Feet—correct. We are still using feet over there, not the metric system. We didn't get the memo yet.

Q257 Nia Griffith: Can you tell us about the whole issue of seismic activity? People here have had problems selling homes because of subsidence, particularly in some mining areas. I think that will be a major consideration in some people's minds when they hear about fracking.

Chris Faulkner: There are three points. First, in Blackpool, where Cuadrilla caused two seismic events, there is 100 years' history of seismic events from coal mining. Secondly, "earthquakes"—let us put quotes around that—in a 2.0 range occur 1.3 million times a year on this planet. It is unfortunate that we did not talk about the other 1,299,998. We talked about—and made a huge deal about—the two that occurred in Blackpool, but this occurs 1.3 million times.

Why don't we talk about that? To give a very rudimentary example, take a gallon of milk in the United States, drop it off the counter top in your home and make sure that it does not explode open when it hits the ground. If it stays closed, that is the same kind of level of tremor that you will see from a 2.0 seismic event.

I would caution that by saying that I would not go to California and start fracking near fault lines and such. I would know the geology you are dealing with; again, that is why it is important to have regulation. However, I would also caution the media against saying, "A 2.0 is going to cause the next Fukushima," because it is not possible. USGS records 1.3 million of those a year, but they are never discussed in the media. They are discussed only when fracking caused them.

Q258 Nia Griffith: Essentially, you are saying it is not a major concern.

Chris Faulkner: I do not think it is a concern at all, unless you are concerned about the other 1.3 million times it occurs that are not fracking-related.

Q259 Nia Griffith: Obviously, you are still causing greenhouse gas emissions if you use shale gas. Why do you think it is justifiable to do that rather than move the US straight over to more renewable sources of energy?

Chris Faulkner: The United States is moving towards renewable sources of energy. You need to keep in mind that renewables require some kind of base load form of energy if you are going to use them for power generation because, very simply put, the technology does not work today. If we can figure out a way to store renewable energy, we will have a different conversation, but until we do, there has to be stand-by power, unless you guys do not want to have the lights and heat on during certain parts of the year. No one will be foolish enough to say that.

Take Germany, for example, and the fact that Merkel wants to shut down nuclear and move to a renewable energy programme, which is great. The reality is that they have accomplished nil as far as renewable energy development goes. They are now having to go back and turn on coal-fired power plants and, even worse, lignite power plants, which are 30% dirtier than coal. So I would caution you about that. I believe our Government said earlier this year that it will be 50 years before renewable energy technology works in a manner that allows for its widespread use. The cost of that is staggering. It requires subsidies. In Germany, it requires an increase of 14% in energy bills to help fund the research and development of energy. There is now a disaster in Maryland in the United States where they are abandoning a wind farm because they cannot get investment from Statoil as a matter of fact.

In 2012, Canada did a study that showed that, when you look at the cost of the stand-by power and the cost of renewable energy, in every scenario and every model it raises the power bill by at least 15% to 20%. You cannot have 100% windmill and solar power and not have some stand-by energy. Again, I am not saying that this is going to replace that. The puzzle still includes all of these things. We also have to address whatever is left of nuclear and coal, because this will not be an all-or-nothing scenario. I do not know any model or anyone who will tell you that renewables can power 100% of the planet. This might even include Greenpeace. It has a zero-hydrocarbon mentality, but it has no plan to

get there. The reality is that renewables, nuclear and coal will be in the puzzle, but it has to be considered at all levels. That includes efficiencies.

Q260 Chair: Mr Faulkner, I am ever so sorry about this, but we have a Minister waiting outside to come in. Although this is fascinating—and I genuinely mean that—I think we have to show some courtesy to the Minister, who has a statement to make later on. Thank you very much indeed for coming over.

Chris Faulkner: You are very welcome; thank you for having me.

Chair: Thank you for your answers and general enthusiasm for this, which was interesting.

Examination of Witnesses

Witnesses: **Rt Hon Michael Fallon MP**, Minister of Energy, Department of Energy and Climate Change, and **Duarte Figueira**, Head, Office of Unconventional Gas and Oil, Department of Energy and Climate Change, gave evidence.

Q261 Chair: Good morning, Minister. Thank you very much indeed for coming along to see us. I believe that there will be a statement about shale later today, but, presumably, none of the general questions we will ask you today will cut across that in any way or cause any problems.

Michael Fallon: Thank you, Chair, and good morning. Later today I will announce a regulatory road map just to clarify for the industry exactly what the steps are if it wishes to explore for shale. That does not change the regulatory process, but it clarifies it. It sets out exactly what the industry has to go through, from getting a licence to getting the final consent from my Department. Secondly, I am publishing the strategic environmental assessment for the new 14th round we hope to carry out next year, which widens the areas under licence. To do that, we have to carry out an environmental assessment. That has been done, and we are publishing that for consultation over the next few weeks.

Q262 Chair: So those are written statements that will be laid in the Library.

Michael Fallon: Those are written statements and I do not think they would inhibit you from asking any questions on either of those two topics in advance. I will make those statements at around 12 o'clock.

Q263 Chair: Thank you very much for that clarification. Can I begin by asking in general terms what you think shale gas is going to mean for the UK and how positive the Government feel towards it as an industry?

Michael Fallon: We do not yet know the full implications of shale gas for the UK. There are some things we do know. We can see the enormous impact it has had in the United States, both on household and on industrial costs, and we know that there is a lot more shale lying underneath us than was originally thought—perhaps two to three times as much in the northern basin, according to a study our British Geological Survey published

earlier this year. There is a lot more than we originally thought. Those are two things we do know.

What we do not know yet is whether we can get it out as easily as it has been extracted in the States and whether we can get it out as cost-effectively as it has been extracted in the States. That is really what drives the next stage, which is to encourage exploration.

Q264 Chair: Obviously, we are particularly interested in Wales. We know that the British Geological Survey is doing a report on shale in Wales. Can you give us any indication of when we might be able to see that report and of what plans you have to discuss it with Welsh MPs and Assembly Members?

Michael Fallon: I am sorry, but I did not hear the last bits.

Chair: Generally, when are we going to get our hands on the report to have a look?

Michael Fallon: As I understand it, the Welsh Government have commissioned the British Geological Survey to do a report, which should be available early in the new year. We are keen to see that, too.

Q265 Mr Williams: We have heard that tens of thousands of wells would be required to drill economically for shale gas in the United Kingdom—the emphasis being on tens of thousands. Is that an analysis you have heard and have thoughts on?

Michael Fallon: No. I do not think we know the answer as to how many wells are likely to be drilled. I think the industry estimates that some 30 to 40 wells will be drilled for exploration over the next couple of years, but I have not seen any firm estimate of how many wells could be drilled in the production phase. Duarte Figueira is here from the Office of Unconventional Gas. I do not know whether he has seen an estimate.

Duarte Figueira: We do not know. Estimates were made by the Institute of Directors in May that talked about a number of thousands of wells, but it is worth bearing in mind, as I think you heard in your last evidence session, that there is a very big difference between what happens at the exploration stage and what happens at the production stage.

At the exploration stage, you might have a pad like the ones I have seen, which are around the size of a rugby pitch. They might have one well on them—or possibly two—at the exploration stage. When you get to production—as with some of the wells that I have seen in Texas—you might have a very large number of wells.

The added complication in the UK is that because the Bowland shale is particularly thick—it is about a mile thick, whereas most shale plays in the States are a few hundred metres thick—you can frack and do a number of different stages at different levels. In theory, you could have a significant number of wells on a pad—the industry has talked in terms of 10 to 20 wells on a pad—so you do not need to think in terms of thousands of locations. You can think in terms of a number of locations, each with a significant number of wells.

Q266 Mr Williams: I was going to ask you about that. The previous evidence session tempered this question somewhat, given the possibilities for the size of pads. Have the

Government made any decisions about the maximum size and scale of projects—the drilling operations that can be allowed—or, as you suggested, is it very much related to the ease with which the shale gas can be extracted? At the root of this, I suppose, is the fact that some of us are concerned—or concern has been expressed; let us put it that way—about the mass industrialisation of the countryside. Glyn and I are well versed in this in terms of wind farms in our part of mid and west Wales. How are we going to avoid the mass industrialisation of the countryside?

Duarte Figueira: At the planning stage, normally a development application would be made. That would specify the production stage. I must emphasise that, as I think you heard in the last session, we will not reach production for some time to come. We will go through an exploration phase for the next two or three years. That will have a number of wells—perhaps 20 to 40 or 30 to 40, the industry has said. There will then be an appraisal stage, at which people make decisions about whether they want to invest, on the basis of well flows and the appraisal of the exploration phase. Then you will start to see a ramp-up of production, probably with full at-scale production in the early 2020s, on the assumption that the shale can be recovered economically and technically.

There is nothing in planning law that limits the size of a shale development. The production shale pads I have seen in Texas in the States were perhaps two or three times the size of an exploration pad, so you might be talking about 2 to 3 hectares, or two or three rugby pitches—a rugby pitch is about 0.8 of a hectare. So that is the sort of size you are talking about. That is something that would be in the application by the company.

Q267 Mr Williams: We have had some evidence from people in Wales that there are concerns that Wales might not develop an industry on a par with that in different parts of England. Notwithstanding the work that the Assembly Government are doing with their geological survey, how can we ensure that Wales gets its fair crack of the whip if sufficient amounts of deposits do indeed exist?

Michael Fallon: We have been working with the Welsh Government to make sure they understand the process that we have in England. Some of these regulatory steps apply across England and Wales. As I shall be explaining at 12 o'clock, there is a very clear regulatory process now—a five-stage process. First, you have to have a licence. We are widening the licence area in the south of Wales, slightly, and in the north of Wales. Then you have to have planning permission from the local planning authority in Wales. You have to have the necessary environmental permits from the Welsh body concerned. You have to have consent for your drilling operation and the construction of your well from the Health and Safety Executive. Finally, you have to come back to my Department for a consent.

So there is a five-stage process, which will apply slightly differently in Wales, but it is there for Wales as for England. Given the activity there has already been onshore, particularly in the south of Wales, in all kinds of extraction, I would have thought there was quite a lot of interest and potential in Wales. There are already some 23 licences out there. We know there are half a dozen operators in Wales. I am pretty confident that, if all this potential is really there, Wales will be involved in it.

Q268 Mr Williams: Finally, the Government announced in the autumn statement the intention to introduce tax breaks for shale gas companies. When do the Government intend to do that? Could you briefly tell us the motivation behind doing so?

Michael Fallon: Yes. These are not tax breaks. The taxation of oil and gas is at a much higher rate than for any other commercial activity. Typically, it is taxed at around 62%, whereas at the moment most corporation tax is 23%. For certain types of exploration—more difficult fields or whatever—there are different allowances, which bring that rate down from 62%. In the case of onshore exploration, it is coming down to 30%, but it is still much higher than the normal rate of corporation tax. So I have to take issue with your phrase "tax break"—these companies will be paying more tax than companies involved in other industrial activities. None the less, for a portion of their profits, they will be exempted from the 62% rate and their rate will be 30%.

That is because it will take them a very long time to make any kind of return on the capital they are going to invest. The time scales involved are probably longer than for exploration in the North sea. There is no quick buck here. It may well take them many years to make a profit on their operations. The allowances that we are putting in place—they apply immediately from next April—will, I hope, incentivise exploration, but they will not bring it anywhere close to normal commercial activity. They will still be very heavily taxed on the gas or, indeed, the oil they bring up.

Q269 Chair: Can I take you back to that? It is a question I wanted to ask earlier. In one of the background evidence reports that we had, one fracking expert from the US said that one well would produce 10 billion cubic feet of gas, which equated to 3 TWh of electricity, but that one well could have 10 spin-offs on the same site. I am sorry that this is a bit complicated, but it was a fascinating calculation. So the 10 would equal 100 billion cubic feet, which would equal 30 TWh, which at 60% efficiency would be 18 TWh of electricity, which is just about the same as the entire British wind industry produces at the moment. The point that this person was making was that one frack pad on 5 acres of land, which is about four football fields, could produce as much electricity as every single wind farm, onshore and offshore, in the UK. It looked reasonable on paper. Do you think that is a reasonable estimate?

Michael Fallon: I am not sure about direct comparisons like that. Duarte may want to comment, but what has revolutionised the extraction of shale in the United States has been the evolution of horizontal drilling, whereby from one pad you may go 3,000 or 4,000 feet down. If you went 3,000 or 4,000 feet down here, you would be drilling out as far as Oxford Circus or Vauxhall or whatever. You could be drilling in dozens of different directions in spokes from a single pad to extract the gas. That is what has revolutionised the volumes that can be brought up in the United States. Of course, that has huge advantages, in that you are minimising the disruption on the surface.

Q270 Jonathan Edwards: How will the gas be transported from the wells? Will there be pipes running into the national grid? Will you have power stations on site, or will it be transported via lorries?

Michael Fallon: No. The operators have to make their connections to the grid. This year we approved an exemption from the normal licensing regime to make it easier for them to do that. I have not seen any proposals that would involve putting power stations next to the

shale. In other countries that is being considered. I saw that being considered in Brazil, where they also have shale, but it is in rather remote areas and is much further away from where they need the gas, so they are putting power stations beside it. Duarte may want to comment on the technical transmission aspects.

Duarte Figueira: You may have had evidence to the effect that one of the great advantages of the UK compared with, say, the US—in this respect, at least—is that we have a much more developed grid network much closer to where the activity is actually happening. Some of the districts in Texas are half the size of the UK, so that means the gas grid is much less developed. We have both a more developed grid network and a very strong regulatory structure, through the national grid, where people can just make applications for that.

As the Minister mentioned, we have removed regulatory barriers by establishing a gas transporter licence exemption, not just for this industry but more generally, to help to make that happen; we did that in August. We think that the grid network will not be a major barrier to development of shale in the UK.

Chair: Do you have some further questions?

Jonathan Edwards: No. I was hoping you had not seen the previous evidence, but you have obviously read it.

Chair: I believe Glyn Davies had a question about European Union regulation.

Q271 Glyn Davies: I was not quite sure whether I might bring that in, but in the last couple of days we have seen some comments in the newspapers—I think this morning the Prime Minister is reported as having made some—about the way in which the European Union, or some part of the European Union, wishes to bring in controls that might make shale gas more difficult to take forward in the UK. I do not know whether that is something that is of concern.

Michael Fallon: Yes, it is a concern, to be honest. We can see the need for the shale industry across the European Union to be clearer about the steps that it needs to take to explore and then to extract. We are clarifying that here, but there are a number of European laws involved and so on. We can see the need to clarify the guidance so that it knows exactly where it stands. What we do not see any need for is new legislation, which could take two or three years to go through the European process. I think it would create more uncertainty and could well delay the investment we need. We do not think it is right that other member states that are ideologically opposed to one form of energy or another—whether it is nuclear, shale or whatever—should be able to stop a member state that does want to get on and develop it, where we have a very robust system of environmental protections already in place. We do not see the need for further legislation at European level.

Q272 Glyn Davies: In many instances, the European Union seems to be able to do things that we in Britain do not approve of; this happens right across the board in all sorts of areas. Is this one of those cases where the European Union may have power to introduce a regulatory system and the UK Government cannot do anything at all about it? Is it a case of our just hoping they don't do it, rather than our saying, "No, you can't do it"?

Michael Fallon: No. As I understand it, this is likely to be a proposal from the European Union. We will resist it. We do not see the case for new legislation in this area. We would prefer this to be done as guidance and to be left to the individual member states to get on and regulate in their own way.

Duarte Figueira: It is worth saying that the proposals of the Commission are not expected until the new year, so we have not actually seen any proposals. Of course, in the time-honoured right way of doing things, we are engaging early and making the views of Government known at official level within the Commission. We are also sharing best practice from the UK—from the Environment Agency, for example—with the Commission, to make the case strongly for guidance in this area.

Q273 Nia Griffith: We have heard the Prime Minister tell us that we could see very cheap gas as a result of shale gas operations, but we have also heard the Energy Secretary say the opposite. We have just heard today that in the States, where prices have come down, they have gone from nought to 40% of their gas now coming from home-grown shale gas. What sort of calculations have been made of the percentages that would need to come from shale gas in the UK to make a significant difference to gas prices in general? Obviously, there are so many variables on this.

Michael Fallon: Let me start by saying that the point the Secretary of State made was that the drop in gas prices in the States that has benefited their households and their domestic industry has not necessarily had the same effect on wholesale gas prices across the rest of the world. Obviously, if shale really gets going in the UK, we could see the equivalent impact domestically, but we simply do not know that yet and I do not think it is possible to make those kinds of estimates at this stage.

Q274 Chair: May I put a suggestion to you, Minister? I was also thinking about this apparent contradiction in what was being said. I presume that, if the UK started fracking for gas by itself, that would simply mean that we would have a lot of gas to export, but if we were to start doing it ourselves probably a lot of other European countries would also be doing it, because we would not be acting in isolation. Therefore, that would create quite a large increase in the amount of gas within the European area. By the law of economics, that increase ought to result in a fall in price, ought it not? If there is a lot more gas around—if it is there in larger quantity—it ought to fall in price, one would have thought.

Michael Fallon: Yes. I was simply saying that we had not done the estimate in quite the way that Nia Griffith was asking. Unlike some of the other member states, we face a position where we are now a net importer of gas. We are likely, by 2030, to be importing 70% of the gas that we need. We used to be an exporter, until around 2004. So we face a problem with gas, which is that we are going to be increasingly dependent on imports of LNG or imports through the pipelines and, therefore, subject to very volatile international prices. We have a very strong interest in the United Kingdom, if there is shale gas here and it can be extracted easily, in getting it out and seeing whether it can indeed have the same economic impact.

Q275 Chair: I may be veering off topic a little bit here, but is it also the case that the Fukushima disaster, which resulted in Japan deciding to close its nuclear power stations, has

had a direct impact on the UK, because it is one of the reasons why a lot of LNG that was coming into Wales, mainly, is now being diverted off to Japan, which is now much more dependent on LNG than it was previously?

Michael Fallon: These are the swirling currents of international markets. We are seeing a very high demand for gas from Asia and so on, and some agonising in the United States as to whether they should be exporting more of the gas that they are producing, reversing their terminals and selling more to where the demand is, not just in Japan but also in China. Duarte, do you want to comment on that?

Duarte Figueira: I was just going to say that, on the question about what happens elsewhere in the world, we produced a piece of work in DECC, by a company called Navigant, which we published in the summer. That had a number of scenarios for what the price impacts might be of development of shale around the world. There were three scenarios, but there was one scenario in it where, if there is significant development of shale in Europe, if there is export of shale from the US—we are now starting to see the applications for that to happen—and if there is development of shale in China, collectively that will have a positive impact on reducing prices. That report is available. I would be very happy for us to forward it to the Committee, if you would find it useful.

Q276 Chair: That would be interesting. I have just been reminded that in some of the previous evidence the reason given for why it was argued that there might not be any cut in prices is that we are on sort of a European network. Do you know whether or not that is the case? Does that mean if we start producing gas in the UK it will feed into the whole of Europe and, therefore, not have much of an impact on price?

Duarte Figueira: The general view is that the UK is part of the European gas network and, therefore, if it developed shale on its own, the total volume in the market would not be enormous. We would, therefore, take a cautious view of the effect of that on price. However, as the Minister said, until we do the exploration we will not know what the price impact is going to be; it could be significant.

Q277 Jonathan Edwards: To put it very crudely, it seems to me that we have a UK Government who are intent on a dash for gas. The Welsh Government, on the other hand, have a very cautious approach to this whole new industry. What discussions have you had with the Welsh Government about exploitation and exploration of shale gas in Wales?

Michael Fallon: We are usually accused by the critics—the enthusiasts for shale gas—of not getting on with it and dragging our feet. Why aren't there thousands of rigs? Why are 100,000 wells being drilled each year elsewhere while nothing is happening here in the UK?

I do not quite accept the distinction you are trying to draw between the two Governments. We are equally precautionary. We want the search for shale to be conducted in a responsible way that can secure public confidence in what is a relatively new technique, particularly the hydraulic fracturing that can be involved. That is why we have a robust regulatory framework in place.

As far as I can see from our work with the Welsh Government, that will be pretty well replicated for operations in Wales. There are some slightly different bodies involved, but I

would not necessarily characterise the Welsh Government's approach as more precautionary than that of the United Kingdom Government. I think we both want to see the exploration for shale done in a responsible way, which is safe for those who are doing the operations but also safe for the environment.

Q278 Jonathan Edwards: Are you surprised that they seem just to be accepting your own regulatory approach, rather than adopting their own approach?

Michael Fallon: There are Welsh bodies involved—Natural Resources Wales and so on. They bring a slightly different Welsh slant. The decision on whether to grant a particular planning permission is for the Welsh local authority concerned. Who knows? They may attach conditions that are slightly different from the conditions that an English local authority might attach, so there may well be a Welsh flavouring to the process, but I would try to steer you away from suggesting that one Government are more responsible than the other. I think we both have a very responsible and precautionary approach to this.

Q279 Jonathan Edwards: Do you think the Welsh Government are laying a little trap for you? Obviously, these developments are likely to be highly controversial. As things currently stand, they would just be pointing the finger at you.

Michael Fallon: It is for all of us to encourage responsible debate about shale. We have done our best on a United Kingdom basis to lay to rest some of the myths involved—for example, about methane emissions, the use of water and so on. We have dealt with some of those concerns. However, it will be up to each local authority to decide whether or not to give permission.

It is up to the developers, of course, to make very clear to their local communities exactly what they are planning, what is involved, to engage with them early and to help the local community see the benefits of shale. By the way, those benefits are not simply for household prices. There may well be benefits for industry here, in reducing the cost of feedstock gases for industry, which will help to retain our industry here rather than see it reshore elsewhere, where prices are cheaper.

Q280 Jonathan Edwards: Is it the position of the UK Government that the Welsh exchequer should benefit directly from revenue from the exploitation of Welsh shale resources?

Michael Fallon: These are matters for the Treasury, which acts for the whole United Kingdom. I think that is probably a question best directed to the Treasury. The revenues go to the Treasury, but, of course, we have in place a system of allocation between the different devolved Administrations, in the Barnett formula and the rest of it.

Q281 Jonathan Edwards: If you were a Welsh Minister, would you be making the case for revenues for the Welsh Exchequer, or would you be quite content for those revenues to flow to the Treasury in London, as they did with the coal industry?

Michael Fallon: You must ask a Welsh Minister what his view of that is, rather than ask me to say what a Welsh Minister might think. I can speak only for the United Kingdom

Government. Revenues go in from all parts of the United Kingdom, but expenditure goes out. As you know, there is a fairly generous level of public expenditure for Wales that is financed from revenues from all over the place. As we are one United Kingdom, there are these cross-flows, from which we all benefit.

Jonathan Edwards: It seems like a good deal for the Treasury to me, but I will leave it there.

Chair: I think we are getting close to the point where I have to step in.

Q282 Mr Williams: The Minister mentions that—quite appropriately, sometimes—there are quite divergent approaches between what is done in Wales and what is done in England, but maybe in this instance Wales could learn from England. The Department for Communities and Local Government issued planning guidance for English local authorities in July 2013. We have had some evidence from people that suggested that the Welsh Government are negligent in not producing a technical advice note to Welsh local authorities taking decisions on shale gas. I do not want to tempt you to get involved in a spat between Welsh local authorities and the Welsh Government, but how important is that technical note guidance to local authorities as they digest potential planning applications before them?

Michael Fallon: It is certainly helpful for local authorities in England. I am not sure whether there is a strong case for replicating it in Wales; I think that has been mentioned. Duarte, do you want to come in on that?

Duarte Figueira: The point about the guidance that was produced by the CLG in July is that it was not new policy. All it really did was bring together in one place all the guidance that previously existed and clarify it for onshore oil and gas—it is wider than unconventional oil and gas. Essentially, it is a bringing together and brigading for operators.

One of the things that it highlighted was that planning authorities—a lot of the guidance is directed at planning authorities as well as developers—should assume that the regulators, whether they are the Environment Agency in the case of England, or the HSE, which covers the whole UK, are able to assess the impacts they are particularly concerned with. Planning authorities should assume that they would do that competently. That is a general known in planning.

In terms of working with the Welsh Government, I would say that we have had a lot of very good co-operation with them on the road map, which spells out country by country how the regulatory system works in each country. As the Minister has already said, there are some little changes—little differences—that sometimes relate to different legislation and so on, but essentially the regime is very similar in all the countries. We have worked very closely with them on that. When that is published and announced today by the Minister, you will see—

Q283 Mr Williams: Notwithstanding what you have just said—I think that regime is very clear—would you suggest to our colleagues that, none the less, a tool such as the clear guidance that has been given to England would be useful to Welsh local authorities? When we had Friends of the Earth Cymru here, there was quite a lively discussion between Friends

of the Earth Cymru and Natural Resources Wales on that very table, suggesting that that would be useful to Welsh local authorities.

Duarte Figueira: It is really a matter for the Welsh Government.
Mr Williams: In the spirit of devolution—thank you very much.

Q284 Chair: Can I ask you about something that arose from your previous answer to Mr Edwards, where you talked about the potential for manufacturing and the potential advantages, if prices came down, for manufacturing industries that are reliant on large amounts of energy? Basically my question is this: is it the UK Government's policy to try to ensure that energy prices are lower than they are at the moment?

Michael Fallon: It is certainly our policy, where we can, to keep bearing down on energy prices, which is why we have looked at those bits of the bill the Government are responsible for—the so-called green levies. You will recall the announcement last month that we expect to reduce those by around £50 a head. One of my jobs as a Minister in both DECC and the Department for Business is to be constantly on the case to ensure that our industry remains competitive—competitive not just in the European Union but competitive globally. Of course, high energy costs are issues that certain industries complain about—the steel industry, the chemical industry, the paper industry, ceramics and pottery, and so on. Certainly for the chemical industry, there is real potential if we can extract shale that happens to be close to it; there is some shale, for example, in the north-west of England and on Teesside. If shale can be extracted relatively close to some of our chemical processes, there is an obvious opportunity for it to be a cheaper feedstock gas, but we are a long way away from that at the moment.

Q285 Chair: Yes, but you would agree in general terms that it would be a good thing if we could reduce energy costs in the United Kingdom?

Michael Fallon: Certainly—absolutely.

Q286 Glyn Davies: I have a question that has occurred to me from news items. They are happening all the time about shale gas because it is a developing industry. There are people who are ideologically opposed to the development of any fossil fuel at all; clearly shale gas is one of those. It is always a case of, "It won't reduce prices anyway" because of the European network that we talked about earlier, but what about when the United States starts exporting gas to here? I read in the last couple of days that Grangemouth is considering importing shale gas from America. That price will not be controlled by a European network at all—or will it? Will that be a price that is set by the US price? It is bound to bring the price down if it will completely undercut what might be produced here in Britain.

Michael Fallon: Yes. The Grangemouth situation is quite complex, as I understand it. The type of ethane they need is running down in the North sea and they need to be sure they can get sufficient supplies of it, but of course it is now much cheaper in the United States. I think they are now looking at commissioning the tankers and building the facilities to be able to import it over here. That is an example of a process that we would rather keep here, if we can. These are important operations, and I do not want to see them reshore unnecessarily. There is now a political debate in the United States about the extent to

which they should allow their gas to be exported rather than consumed locally in their own market.

Q287 Nia Griffith: Can you give us an idea of what proportion of Wales and the UK has been licensed for exploration?

Michael Fallon: I am not sure I can give you a percentage figure. There are 23 licences out there at the moment. They are in a large area of south Wales—some around Newport, I think, but essentially from Cardiff all the way across, through Bridgend, to Swansea, where some of the old coal working was. That was the last round, covered under the 13th licensing round. There are also some in the north, from the Wirral to the west—through Wrexham and around the south of the Wirral. It is a relatively small area. I could get you the percentage figure, but I think it would be quite small. Most of the middle of Wales and the western coast of Wales does not have a high prospectivity; I think that is the technical word. The map we are publishing at 12 o'clock shows a slight extension of those areas, but not massively.

Glyn Davies: I want to ask a question specifically on that point, before you move on to another point.

Nia Griffith: I have two related questions, but you carry on.

Q288 Glyn Davies: Last week we took evidence from the energy adviser to the Welsh Government. Sitting there, he told us that the whole of Wales, apart from Anglesey, had shale gas underneath it and he suggested to me that he saw the whole of Wales, apart from Anglesey, as being a potential shale gas area.

Michael Fallon: We will see what the British Geological Survey reveals. There is shale everywhere, in lots of places. The question is whether or not there are sufficient reserves of it to be extractable. It is more likely to be extracted in the areas that I have identified.

Q289 Nia Griffith: Obviously, we have a long tradition of North sea gas, and the Coal Authority has issued licences for underground coal gasification exploration offshore in Wales. I wondered what work had been done on the economics of offshore shale gas fracking and whether any consideration had been given to issuing licences for offshore work.

Duarte Figueira: There have been some previous questions from other Select Committees around the offshore shale opportunities. It is generally reckoned that the costs of offshore shale gas and shale oil development would be of a significant order above those for onshore. At the moment there is no example around the world of offshore shale gas being developed, so it is something we would have to look at in the longer term. It is not regarded as something that is prospectively economic at the moment.

Michael Fallon: I should also clarify that the 23 licences that are out there at the moment are not all for shale gas. Some of them are for conventional oil and conventional gas. Others are for coal-bed methane extraction. Others are for vented gas and so on. There is not a great deal of shale being looked for at the moment.

Q290 Nia Griffith: What discussions does DECC normally have with the Welsh Government before the issue of licences?

Duarte Figueira: There have been discussions between the licensing team in DECC and the Welsh Government as part of the scoping work for the strategic environmental assessment. The normal application process for licences involves an operator coming directly to DECC, so DECC is responsible for the licensing process there. We will have to come back to you with a note on whom DECC might consult in that process, but my understanding is that essentially it involves an operator talking to the licensing authority at that stage.

In the case of Wales, the other stages the Minister talked about are largely devolved. Planning is devolved and the environmental regulation is devolved. The Health and Safety Executive is a UK-wide function. The licence then comes back to DECC for a drilling consent. That is the way it normally happens.

Michael Fallon: Of course, quite a lot of this activity is commercially confidential. The companies do not want to talk about their various plans and so on, so they come to us and discuss these things in confidence.

Q291 Chair: I just wondered about that. I completely understand the need for commercial confidentiality, but in general terms I wondered what the business plan was. If a company—let us be honest, these are companies we have not normally heard of; they are not usually the big five, such as BP, Total and Shell—comes along, pays money for a licence and finds that there is exploitable shale, does it automatically have some right to exploit that, provided that it can get the planning consents, or is there some other kind of bidding process that would allow one of the big companies to come along and make money off the back of its exploration? How does it actually make a buck? It will cost it quite a few million just to drill down and find out whether there is shale there. How does it ensure there is a good chance it will get a return on that?

Michael Fallon: It has exclusivity for the licence area it is drilling in. What happened in the States was that fairly soon the larger companies let the smaller companies take a lot of the risk and do a lot of the exploring, and then tended to come in behind them and start buying up the smaller companies that had the more productive licences. It is very early days yet, but what is interesting is that we have already seen a couple of the majors getting involved in this. I think Centrica is already involved, with a stake in one of the companies; GDF Suez has taken a stake in one of the others.

The majors—the big oil and gas companies—are certainly taking a very close interest in it, but you have put your finger on something very important. There are huge risks in this business—you can spend millions and millions of pounds and not hit oil or gas. There is a very long lead time, and you may make no money at all. That is why it is important to have a certain fiscal incentive in place.

Q292 Chair: So you would foresee that most of these companies doing the exploration—I think you gave a figure of about 25—

Michael Fallon: There are 23 licences out there. I think that at the moment in Wales there are seven operators of those 23 licences.

Q293 Chair: So these are not necessarily the Shells and BPs of tomorrow. These companies may well become part of companies like Shell and BP tomorrow. They are more likely to be bought up than to become the next huge household names.

Michael Fallon: That has happened to some extent in the United States. There has been a concentration of some of the companies, but we will have to see. These are very early days here, so we are reliant on a handful of companies—perhaps a dozen companies across the UK—that are out there and are prepared to risk their capital and to get on with the exploration. It is very important that they are encouraged to do that if we are to unlock the potential of shale here.

Duarte Figueira: The Americans have the expression "wildcatters" for the group of companies that went in and did the initial work in the various basins. You have then seen the much bigger companies come in and take a shareholding or take them over. In the case of Wales, one of the companies that have licences is Dart, which has a partnership with GDF Suez, so you are already starting to see that. This morning there was a report on the radio about Tata's interest, for example.

Q294 Chair: Was that on the radio today?

Duarte Figueira: Yes.

Michael Fallon: The majors are hovering behind the smaller operators.

Chair: I do not see any further questions. Thank you very much, Minister, and Mr Figueira, for coming along this morning.