

TRANSCRIPT OF APPG ON SHALE GAS REGULATION & PLANNING
20TH APRIL 2016

Kevin Hollinrake

Thank you for attending this inaugural session of the All Party Parliamentary Group on Shale Gas Regulation and Planning. Just to explain from the outset, this group is not here to decide or to debate whether we should or shouldn't push ahead with shale gas exploration – that decision was taken in the House in January 2015 as part of the Infrastructure Act and was passed by a majority of 250 votes. What this is about is looking at the regulation of shale gas exploration and the planning aspects of it to make sure both those elements are fit for purpose and if this goes ahead – also I feel this forum could be a very vehicle for monitoring the outcomes of any shale gas exploration that goes ahead. So it could be a very key body I feel in informing the debate both in this place and further afield. What we intend to do over the next twelve months is produce a report based on the evidence we gather both from the expert witnesses we have today and further sessions to then give our view on whether the planning regime and the regulatory regimes are fit for purpose.

Just to explain – we will shortly ask for the witnesses to give evidence and make a short introduction of who they are and what they do. We will have the opportunity then to have questions to the witnesses. I would ask questions to come through myself as Chair of the Group – my name is Kevin Hollinrake, Member of Parliament for Thirsk and Malton and one of the Members of Parliament with a current application for shale gas in his constituency. So questions through the chair – I will give priority to members to ask questions first and then obviously to members of the public to also ask questions. Please keep your questions short and brief – we are here to hear from the experts and to listen basically and to try and make the best of the information we receive. Just to explain that the times are slightly different from those published. We hope to finish by 11.15 – today is a busy day in the House – we have Prime Minister's Questions so members will probably want to get off and get their seats in the House for today's events.

Just some formalities: we have a few apologies for absence from Alan Whitehead, Julian Sturdy, Frank Field, Lord Ashdown, Lord Inglewood, Lord Lipsey. Dr. Whitford, Graham Evans, Rushanara Ali, Phoebe Jefferson from Newcastle University and Professor Liam Herringshaw from ReFINE.

Returning to the minutes of our previous meetings which have been circulated. There was a slight correction to the minutes of 24th February in that we referred 'UKOOG' rather than 'OUGO' – so corrected minutes there. Other than that I assume there is no objection to the minutes as published. Just to discuss invitations for our next meeting which we hope to be on 7th June but that's not been confirmed as yet. The next session will cover the planning aspect of shale gas which I think is at least as important as the regulation – making sure that any roll-out of shale gas is done in a considerate way for local communities and doesn't change the very landscapes that people enjoy. So from that aspect any suggestions from colleagues about ministers we may call. I think we are suggesting James Wharton from his brief in DCLG – any more suggestions? I think we've got some suggestions ourselves, Nigel haven't we? Nigel – there was the Royal Town & Planning Institute.

Just one thing to point out that has been mentioned a few times about of All Party Groups. There is no funding for this group – it is purely self-funded – so there is no implication of any kind of external influence on what we think and what we say and certainly, as with all the groups, members are invited across the House whatever their perspectives were and there are different views within our membership already which I think is healthy and what we want to see.

So this will be a truly independent group. I think we are 5 minutes before we start questions – any other points to raise prior to that ?

Minister I was just explaining that this group is not about debating the merits of fracking in terms of whether we should push ahead or we shouldn't – that decision was made some time ago. This is about making sure the regulation and planning aspect of shale gas exploration are fit for purpose.

Just to start – what I would like to do if possible is to ask each member of the panel to introduce themselves and exactly their role within the shale gas explorations.

Andrea Leadsom

I am the Minister of State for Energy and Climate Change so my portfolio includes all power generation, including *possible* future power generation, so shale gas comes under my portfolio and I think as everyone knows it is a key priority for government to explore the opportunity from home grown natural gas – bearing in mind, as things stand we receive about 40% of our gas requirements from our own North Sea resources and the rest comes in the form of piped gas from Norway and liquid natural gas from other parts of the world – so for energy security, for lower carbon (which natural gas is over LNG) for the economic opportunity and for all those reasons the Government sees exploiting shale gas as a key opportunity. So I have responsibility for all the policy areas.

Mark Ellis-Jones - Environment Agency

Firstly thank you very much for the opportunity for coming to talk to you this morning. My name is Mark Ellis Jones, I am the Programme Executive for the Environment Agency's onshore oil and gas programme and I am accompanied by Charlotte Danvers today, who is our Programme Manager. The Environment Agency is the primary environmental regulator for the onshore oil and gas sector, which obviously includes shale gas and hydraulic fracturing. We have done a thorough assessment of the risks of the sector, including shale gas and hydraulic fracturing and we believe that the Environment Agency has the right regulatory controls in place to regulate the sector, to protect the environment and local communities. To date we have issued three sets of environmental permits for shale gas in particular but obviously the onshore oil and sector is much broader than that. But for shale gas in particular we have issued permits for two in Lancashire, one site quite recently in Yorkshire. We have done so after extensive local public engagement. We have thoroughly and rigorously assessed the applications themselves from the operators and I think the permits we have issued for all three sites we are confident have the right volumes of controls to ensure that those sites can be operated safely and well.

Now the Environment Agency is investing a significant amount of resource into this area. This year my programme – Charlotte's programme strictly speaking – is funded at about £2.6 million. We've got in excess of 47 members of staff, ranging from technical staff on regulations – waste, emissions to air, land and water – as well as community engagement specialists and advisers to government and people working with our colleagues in other regulators like the HSE. So we are actually committed to making sure that this sector is regulated properly. We think that we the right controls and we are very happy to here and answer your questions today about our role and the regulations we have. Thank you for the opportunity.

Jim Neilson – Health & Safety Executive

To my left is Tony Almond – we both work in offshore and onshore home gas policy. We are responsible for making sure the regulations and guidance on operators working on shale gas is suitable and sufficient and obviously creating a regulatory regime around that to oversee operators as in their own responsibilities.

I think a good starting point is to remind everyone that the UK is one of the safest places to work. The Health and Safety Executive for the last 40 years have been regulating health and safety in all our work places. Basically terms there was a significant improvement in the health and safety performance across sectors during that time. How did we do that ? It's about having a strong regulatory regime in place making sure regulations and the guidance work effectively, the proportionate managers are included and understand them and how they work. It's also about being a strong regulator. We have the resources and the competence to challenge the industry and make sure the requirements are safe. When not we've got the power to take enforcement action so that's how we ensure that standards are maintained. Of the actual onshore oil and gas industry, we've been responsible for that for twenty years. I think if you ask the regulators how we work I think they would confirm they think our oil and gas regulatory regime, as well as for other major accident hazards like the chemicals industry, is robust and world leading. It's all actually underpinned by one key principle and that is it's the operator who creates the risk and is responsible for managing and controlling it.

Mark has already mentioned that the HSE and the Environment Agency work in a coordinated way across a number of industries like the chemicals industry. For onshore oil and gas, particularly shale gas we've had a working together agreement since 2012 and that commits us to joint inspections of shale gas work sites, of sharing information and basically work in a coordinated and effective way together as regulators and that has been working well for us. We have legislation in place that covers specifically onshore borehole sites, shale gas sites and the wells and that legislation's there to place requirements on the well operator to ensure well integrity and to provide us with information that we need to be able to effectively regulate them and I am happy to go into that in detail later.

Question – Kevin Hollinrake

I'll start with the Minister. Both the Royal Society and the Task Force for Shale gas reports on this area recommended either a lead regulator or a bespoke regulator rather than having a raft of regulators some of which we've seen here today. What's the Department on where we are with that move towards a single regulator ?

Answer – Minister

The view of the Department is that we are absolutely open to the idea of that but as things stand there isn't a shale industry. There hasn't even been an exploration well properly drilled and the question of whether shale gas can be extracted has not been established. So I think the key point is that the Department recognises that where there are unique features and unique concerns around shale gas that we should introduce unique regulations. I think an example of this might be the one around whilst hydraulic fracturing is taking place that there should be strict limits on seismic movements that would require that fracturing be halted in the event that seismic activity exceeded a very minimal point and that's an example of an introduction of a new regulation specifically for the hydraulic fracturing space. But the truth is that we don't just create a regulator for a non-existent industry and so it would be something that will absolutely remain under control.

But the Department has been very clear – there is absolutely no chance that we would support the hydraulic fracturing process or the establishment of a shale gas industry if we felt there was any risk whatsoever from inadequate regulation, from inadequate safety processes and so on and we absolutely believe that the combination of the regulators that we have are more than up the job of what, as I've said, is as yet not even an industry.

Kevin

One of the complaints we do hear from the general public is what if something goes wrong – who do we talk to, who do we blame, who do we point the finger at? That's the concerns people have, whether some element of this - probably some finger pointing - or one of these things falling between cracks. I take your point (...) but that's the concern people have.

Minister

I completely accept that but as ever there is always a balance in these things. If you don't have an industry then there isn't much point setting up an independent, bespoke regulator with all of the costs that that would incur – the transfer of skills, the set-up of new systems and processes that are already working extremely well in the way that they are divided – equally there is no activity for people to complain about as yet so there hasn't been an issue, a problem for people to point to and say “well this would have been better had there been a single regulator”. So I think the problem is – I completely sympathise that people would like to sort of have a body, but of course there are always costs and risks associated with establishing anything new – significant costs that would then need to be born either by the industry or the taxpayer or a combination of those things. And significant risks that would evolve from trying to merge different parts of HSE and the Environment Agency at a time when there just isn't the evidence of the need for that. But as I've always said, we are very open to that discussion.

Kevin

And from an EA health and safety perspective (...) Is this the sort of thing you would like to see or would you be resistant to?

Mark Ellis-Jones - EA

As I said in my opening statement I think we are confident that we have the right regulatory controls at our disposal already. You know, we issued permits to three sites and we are satisfied that those permits are adequate and have the right controls to make sure that these sites can operate safely in protecting the environment. Arguably the Environment Agency works with the HSE and other regulators including the mineral planning authorities on other complex industrial sectors, as our colleagues in the HSE mentioned – chemicals but also power plants, nuclear industry and so on and I think the institutional arrangements that we have at the moment for regulating industry are seen and proven in all of those other sectors and we see no reason why that institutional framework shouldn't be fit for purpose for the shale gas industry.

Jim Neilson – HSE

The Health & Safety Executive agrees that in principle it's important to keep all regulatory systems reviewed – especially if they were going to be moved from the pilot stage of shale gas that we have at the moment in early days to a more commercial operations. I think we need to be very clear when we are doing that reviewing and we're talking about a single regulator, what we actually mean by that phrase – what would we expect that regulator to do – what would be the roles and responsibilities and basically its brief.

For example the key lesson from the last two major accidents in other countries was that it's important to have distance between the regulators responsible for licensing and industry promotion and those responsible for safety and environmental protection. If we don't keep that distance then there is a conflict of interest potential and this could affect safety and environment protection. So we've got to think very carefully. I think the current regulatory regime for the pilot phase has been shown to be robust by the reviews that have been done so far and there are other competent authority regimes out there for onshore chemicals and offshore regulation of oil and gas and they may apply to shale gas in time as it goes commercial, so we need to basically keep the review to the appropriate time when we look to go commercial.

Lord Truscott

The Minister mentioned seismic activity and of course it's a very controversial area provided with regulation. There has recently been a new report, co-authored by the Canadian Geological Survey, which confirms the definitive link in their words between hydraulic fracturing and almost every large earthquake in British Columbia and Alberta since 1985 and unlike the evidence coming out of the United States this is not linked to underground waste water disposal. Would the Minister agree with the reporter's conclusion that it is important to conduct more research to figure out the best balance between the protection of public safety and the environment and economic benefits of developing unconventional oil and gas.

Minister

What I would say is that the experience elsewhere from 1985 onwards bears very little relation to the regulatory environment that the UK has in 2015 and 2016 and that our regulation is absolutely the tightest in the world. We have learnt from all of the experiences elsewhere in the world. I don't know the report you are referring to but if it's relating to activities that began back in the 1980s then I would very gently suggest that there is an awful lot of things that happened in the 1980s that we wouldn't subscribe to and that we would not be allowed or feasible in the UK sector. I would always and my Department always thoroughly looks at any new report that has any sort of bearing in truth very carefully to look at lessons learnt and we absolutely pride ourselves on having the world's best regulation that seeks to ensure that we maximise the use from all research that we find wherever it comes from. Obviously there have been enormous scare stories that just are not even slightly credible about different technologies, different activities, that are put about and so I'm afraid there has been an awful lot of crying wolf about this sector and what we actually need in the interests of UK security, the opportunity for the UK, is to actually look at the facts and look at *proper* studies and to recognise that the UK *is* and intends to *remain* the best in the world and not something half-baked that took place in 1985.

Tom Elliott MP

Can you talk me through the process that currently applies for a licence or for a planning application?

Minister

First of all a company can apply for a licence which simply gives them an area of ground in which they then have the exclusive right to look for hydro carbons. That licence is allocated by the Oil and Gas Authority and that Oil and Gas Authority is subject to the Energy Bill which is in fact today having its ping pong so I am hopeful we'll get Royal Assent very soon and the Oil and Gas Authority will be properly up and running. So that's an independent arms' length body that allocates the licence which just gives the geographical spread.

Then what the developer needs to do is seismic studies to get a sense of where there might be the potential for shale gas and obviously what they will also need to do is to take account of the arrangements that we consulted on that we hope to announce very soon where it is our intention to not allow drilling at the surface in any special areas – National Parks, SSSIs – so the development in exploring their seismic activities will need to take account of where they might not be allowed to go, so that will be for them to do and for them to get access to the land and so on. Only at that point would the developer think right, this is the spot and they would then submit applications to the Environment Agency and to the Health and Safety Executive and to the local planning authority. Obviously the local planning authority has then the sixteen week statutory time frame that they have for everything - whether it's a warehouse, a power station, new housing estate or whatever – a sixteen week time frame in which to come to a decision which relates to issues like traffic movements, the impact including accumulative impact – if you've had lots of frack pads on the local community, the visual amenity and so on. So they will be looking at that bit and then I'll leave it to my colleagues to explain exactly what the developer will be looking for from a review.

Charlotte Danvers – EA

An operator would come to us early and notify us of their plans in the local area and we could give them advice as to the state of the local environment and our needs in terms of protecting the ground water. We have a published ground water protection policy which sets out certain zones that we seek to protect. So we would have that early conversation with an operator to give them some advice. They will also be embarking on some baseline monitoring, which would be a requirement of their permit and would also be a requirement of the Infrastructure Act as the Minister has explained. The operator then makes an application to us, we would assess that application and we would also note their operator competence, which would include a financial check round the operator. We would then consult the public on that application – consult widely especially as these sites would be designated as being a high public interest – so that consultation process is much broader than a normal consultation process. We then look at those responses – we then consult again on our minded to decision so that we can explain to both regulators and to communities as to how we have looked at all of the impacts, how we have assessed those risks and how we have come to our view and whether controls are in place. A permit is then issued, if we decide that is the right thing to do and then regulated process of compliance and enforcement starts – our process of inspecting sites, checking monitoring data, reviewing reports and enforcing the permits.

Tom Elliott

You did mention public consultation but some way down the line. Is there no requirement that the company could carry out any public consultation before they come to (...)

Minister

Yes absolutely – developers do carry out public consultations during the entire process as do the local council. There are planning meetings and public meetings and in fact the consultation has been very wide indeed and your Chairman has arranged public meetings for the public to be able to understand the process, so going beyond the strictly required statutory consultations but actually trying to help people to understand exactly what the process involves and so on.

Jim Neilson – HSE

Basically the Health and Safety Executive's role in this process is really to ensure that the well is designed, constructed and operated in a safe way – we call that well integrity. How do we make sure the operator does this effectively? I think we need to start at the beginning. We are involved in developing the standards and guidance with industry and what we would expect them to do. We also do a new, first time operator (...) and we would meet with them and make sure they understand the right process we expect them to follow. Twenty-one days before they start drilling the well they need to send us a notification. That notification outlines how they are going to design and construct that well for shale gas. It will need to include their intent to do hydraulic fracturing, if that is what they are planning to do and it will outline the standards which they are going to apply to that well. Once they have submitted to that we assess it against the current good practice and standards we would expect. Basically we will inform the Oil and Gas Authority that we have no objections to them starting. At that stage, once work has started, every week during the operation the operator needs to write to us and tell us exactly what they can report – that they're doing that week and we'll be assessing to make sure that the operations going on site actually match what they said in the original design and construction application. Basically each well operation needs maintenance operation right up to abandonment is covered by that process – they must submit it with a notification and they must basically send us a report so we can monitor weekly what's happening. During those processes obviously we'll do the site visit and take a look at the whole borehole site and not just the well and we'll take enforcement action if there is any reason for us to do that.

I think obviously incidents do happen and we've reporting schemes in place for example if there was an unintended release from the well then basically that legally has to be reported to HSE and we would look into the reasons at exactly what happened in case there's any release of even the smallest amount of fluid and that would be investigated. We've also got an additional quality assurance required by our legislation which basically requires the operator to offer a well examination scheme and that well examination scheme basically has a medical person that checks all the requirements that the operator is putting forward to us (...) and make sure that they have actually performed to the required standards. But that's an additional check on the quality assurance (...)

Tom Elliot

Just for clarification, if there is no public consultation required as a statutory basis prior to any application being made.

Minister

There are consultation requirements through the planning consent process – what exactly do you mean – you think that they should consult before they even consider whether they apply for a licence?

Tom Elliott

(...)

Minister

The statutory requirements for all planning are the same. They're statutory processes for consulting with the public in all planning applications, so it's the same whether it's a power station. The problem is hydraulic fracturing is an industrial process like any other – it's the same process as if you were applying to open a chemicals plant which people can legitimately be concerned about. There would be the same planning process for both of those – it just not the case that hydraulic fracturing is in some sense different in terms of the requirement for the planning process.

Charlotte Danvers – EA

Could I just add, in addition to that, it might be helpful, about how the public can understand a bit more about the processes involved. We are doing some engagement activity, joined up all of the regulators in the areas that have been recently publicised through the PEDL round – Petroleum Exploration Development Licensing round – and that was a sort of consultation process and those maps are available. We are doing engagement with communities so that we can explain before applications are made more about how these regulations work in practice – before the operator makes an application.

Baroness Young

(...) the issue of National Parks, the ONBs and whether that collection of exclusions should be extended further to signal to the Government that the special areas of conservation and special protection areas were also areas which should be, although they are very protected under European legislation, but the (...) just explaining that these very sensitive areas (...) was one that seemed to be quite contentious. I would just ask the Minister to say whether in fact she believes the regulatory system is going to be sufficient to protect them.

Minister

I think unfortunately there was a lot of misunderstanding about the hydraulic fracturing regulations so the Infrastructure Act – in order to have a Statutory Instrument so regulations, you have to have powers in primary legislation given to you to impose those secondary regulations. And so with the hydraulic fracturing sub-service those powers were given to the Government to be able to introduce restrictions on sub-service hydraulic fracturing by the Infrastructure Act. But there weren't any powers to create regulations on surface level drilling – those requirements come through the licensing regime, which is not a subject to a Statutory Instrument. So what I genuinely think happened is that when the hydraulic fracturing regulations came out everybody was expecting it to comment on what happens at the surface, but those powers were not available to comment on what happens at the surface. I don't know what the technical legislative term is but you can see my point – you can only create regulations around something that you have been given the powers to do in primary regulation.

So therefore the regulations were on what happens under the ground and so what we agreed in the regulations was that under special areas – National Parks, AONBs, nature etc. – you would not be able to fracture or have a well at higher than 1200 metres below the surface. Whereas for other areas it would be a 1,000 metres as set out by the Infrastructure Act. So what that was doing was adding an extra depth below special areas. But what those regulations did not deal with was what happens at the surface and of course for most people that's the bit they're concerned about as it's the bit you can see, not the bit you can't see.

So what we have consulted on – and we're hoping to make an announcement very soon – is on the restrictions that we intend to impose on drilling at the surface and we intend to not allow drilling at the surface of any special areas – including National Parks, AONBs, SSSIs etc. – and therefore those licences, that as I mentioned earlier are issued by the Oil and Gas Authority – would then have restrictions around surface drilling in those special areas. So, as I say, I think unfortunately, down to probably some misinformed media articles, people are expecting the regulations to set out surface drilling but we didn't have the powers to do that and so as yet those surface restrictions have not been finalised but we have consulted on those restrictions and we expect to make an announcement in due course.

Baroness Young

Could I just Chairman take that one stage further. You did refer briefly to multiple fracturing pads and that seems from some of the international sites to have been quite extensive – you know if you've got to move the drill and the borehole around quite a lot in order to get access to gas and you end up with multiple pads. Under what regulatory regime are we going to try and avoid a kind of 'pad sprawl' if I can call it that in areas where there would be sensitivity ?

Minister

The planning authority takes into account the visual impact, including the cumulative impact on local amenity. So there is not sort of intuitive reason why drilling in a National Park is more attractive than drilling in a brownfield site - that for a start I'm sure intellectually you would agree there is no particular reason why a developer would chose to go somewhere sensitive over somewhere insensitive, much less sensitive. Then the issue is exactly as you say – you going to have say 3,000 frack pads and the answer would 'no' – the planning system would ensure that where that impacted on visual amenity and didn't make sense because of the cumulative impact, that would be a perfectly legitimate planning reason to disallow further frack pads. But I should also say that I've visited a lot of onshore, conventional oil drilling sites and gas sites and actually what happens is you get a great big sort of football pitch size gravel and in particular with shale gas, because the pumps are underground. You know you see these pictures of nodding donkeys – as you will know the pumps to get oil out of the ground are nothing to do with gas whatsoever. In fact what you will have with a frack pad, is you will have – they're called Christmas trees like a tall red pillar box – they don't look at all unpleasant – in fact they are about 8' high so a bit taller than a human and you would probably have about ten of those Christmas trees in one frack pad and those would be ten drills that go down and then spread out underground. When you consider the cost to the developer of the whole planning process and so on and so forth, that would lend you intuitively – number one don't bother with the National Park – though as I say we're not permitting that anyway - we're hoping to make that announcement very soon. Number two don't bother with a sensitive site right on the edge of a village that you won't get through planning anyway and number three make is as concentrated on each frack pad as you would have ten boreholes on one frack pad – don't have one there and one over there ten miles away, that adds to the cost and of course developers are business people, they are not there to destroy the environment, they are not there to upset the community.

So there's just been so much misinformation and I can absolutely assure you if you go an onshore conventional site you will see very clearly they are not noisy – everything is hidden in a sort of green box that looks a bit like a container but once it's screened you can't even see it. There is just nothing to see, it's an extremely boring site and so far from there being thousands of these things – and certainly obviously at the moment there aren't any – I would challenge anyone in the audience to be able to name an onshore oil site. I mean I visited one recently which was right in the middle of one of our greatest National Parks – it's been there since the 1930s.

You know there's a beautiful chocolate box village right on its shoulder who love it because every time the school needs anything or the church needs anything – yep – here you go – there's the money. It's part oil site and part ecological project. They've done more for replanting the forest and preserving bats and everything, so this whole kind of mania about you know “the world's going to end” – we really need to deal in the facts and this idea of cumulative impact, I just don't see it. The planning regime as it exists today would absolutely prevent massive cumulative impact.

Kevin

We will be covering the planning aspects of this in more detail in the next session.

Baroness Young

One tiny little follow up. You talked about coming out with surface impacts for National Parks. Are we going to see there being a distinct set of rules for National Parks, AONBs, SSSIs - how far will it go ?

Minister

All of the above – all of the acronyms. Yes that's what we've consulted and as I've said we will be making our announcement as soon as we can.

Lord Young

My apologies for being late Chairman. I just want to clarify – I didn't think we were going to permit drilling actually in the National Park, I thought it was going to be adjacent. The fact that drilling process now is you have to go so far underground that you wouldn't have to. I am puzzled about restrictions on surface. The planning process is pretty rigorous and that's why I tend to irony. Given that even though the planning office of Lancashire recommended that it was OK the council still rejected it in my view on grounds that were wrong. So the idea that somehow National Parks would be desecrated or even the geology of National Parks would be – given that you're drilling down 1200 metres as you said – there would have to be some pretty deep tree roots to even impact on the geology. So I welcome the Minister's view whether I got that right.

The final point I wish to make is that – would the Minister agree that there is a need for balance in regulation. The idea of regulation is not to create an environment where it's almost impossible or uneconomic to develop fracking. All that means is that we are sort of offshoring – we don't care what happens in other countries. We don't care whether the gas is liquefied and then sent here, a process that is not particularly environmentally friendly. So my plea is that there should be balanced approach. I don't want the environment destroyed, I don't want any risk to water tables or anything else, but I do want a valuable, natural resource that could create thousands and thousands of jobs and in an environment where we've already 65,000 jobs in the North Sea.

Minister

May I point out that I am very grateful to you because number one you are exactly right – the planning process would already have approved drilling on the surface of National Parks and so in my explanation of our intention to restrict in the licensing is really to even further ensure that the legitimate concerns about the environment are absolutely met and that there is no chance that even an application could be put forward let alone one that would then subsequently turned down.

I just really want to reiterate – as I said at the beginning this is a huge opportunity for the UK. As you point out and as I mentioned at the start, 60% of gas needs – and 80% of us use gas for heating, for cooking, for all our industrial processes – we talk about electricity generation all the time – gas – we are absolutely in massive trouble if we can't get gas. We are already importing around 60% of what we need – by 2030 it'll be around 75%-80% of what we need. This is a huge natural resource that could create tens of thousands of jobs and a huge increase in our GDP – enormous benefits to the Exchequer. In the north of England it could do an enormous amount for the northern energy powerhouse – something very close to my heart – and it's natural gas so it has a much lower carbon footprint than NFG. It is a complete no brainer and I can absolutely reiterate there is no way we would be doing this if we thought that we couldn't regulate it properly and that there were risks to humans or the environment – we wouldn't be the best regulator in the world and we already. We've got more than fifty year of safely regulating on and offshore – we are the world's experts in this area.

Lord Truscott

This is a question actually for Tony from the HSE and Mark from the Environment Agency. To regulate something properly you've got to understand the science and just referring back to the Canadian survey that I mentioned before; they are saying that they have evidence that 90% of seismic events over magnitude 3 were triggered by fracking oil and gas underground. But nevertheless only 1% of the wells fracked caused these events and the point is to identify why and the scientists themselves say they need to determine what factors caused 30 wells to trigger quakes and it's only if you can understand the cause and link that you can actually regulate properly. So what science do you rely on to regulate the industry properly and how do you approach the scientific evidence ?

Mark Ellis-Jones

As I said at the beginning the Environment Agency has done a thorough risk assessment of the process itself. We drew on the latest science methods that we found at that time, including obviously our own in house technical expertise, so we have expert hydrogeologists and also on waste management, emissions to air land and water. We did our own very thorough assessment of those risks and then matched those with the environmental regulatory controls that we have at our disposal so obviously the risks are really only a risk if you can find a way of managing those and bringing the right controls on. And we were really satisfied that those controls will manage the risks that are presented to us at this stage of the industry's development and I think we should always be reviewing our regulatory approach, we should always be reviewing the controls that we have in place as we have invested quite significantly over the last few years in our own evidence and research programme. You'll hear it from the refine programmes you will next witness that we've part funded many of the studies as part of the refine suite of research.

We are committed to continuing to do that including obviously including that evidence we were talking about – actually I was in Canada about this time year when I visited the energy regulator and the British Columbian Oil and Gas Commissioner – on a fact finding mission to understand not only the regulatory controls that they have but also some of the issues that they have as well. It was absolutely for me to learn from some of the mistakes that have happened in North America. But I think our regulatory system is very different to the system in the US and Canada as our colleagues from HSE have already highlighted.

Actually I think our regulatory regime is world class and there are some things that have been allowed, certainly in the US, that we just simply wouldn't allow in this country, so for example open lagoons, the storing of waste waters, uncased well shafts so there is no barrier between oil and gas coming up the well and seeping into the environment and a number of others. So we need to be careful about the comparisons because the regulatory regimes are very different. I think ultimately we are confident of our controls but also again we want to invest in the research and the evidence as it has evolved.

Balcombe

We have been hearing from the HSE how the industry is being allowed to self-regulate. You very clearly said that today. I'm from Balcombe and that was definitely our experience in Balcome. You know the HSE never came to inspect our well and never had any meetings they were meant to have before, during and after with the Environment Agency. What confidence can we have in these agencies ? Four years ago I felt that the HSE and Environment Agency were there to protect us – they were guardian angels. What confidence can we have – how can these agencies feel it's OK for the companies just to report to them and not any inspection ?

Kevin

It's an interesting question I have heard many times. What's the prior activity in terms of our inspection regime on these activities both from the HSE and the Environment Agency ?

Mark Ellis-Jones – EA

We were quite visible during the Balcombe project. Actually we struggled to get on site because we were advised by the police at the time that we couldn't get onto the site. That did at the early stages hinder our ability to do our normal compliance checks that we would but as soon as we were able to access the site safely we did and we were absolutely confident at the way in which that site was constructed and the way the borehole was drilled. It met our standards and we have subsequently done other visits, as we do with all our oil and gas facilities so we do have commitment to be visible and part of our regulatory enforcement process is absolutely to do spot checks and site visits as we have done on many of the oil and gas sites.

Jim Neilson – HSE

My colleagues will give some details about Balcombe. I just wanted to say something first and it touches on Nicole's question a few minutes ago. Obviously HSE has well engineers as part of its staff and they are experts who continually look at the monitoring information that's coming from the wells that's provided in weekly reports and provided in notifications. They have to keep up to date with the current developments, current research and engineering to be able to make those judgements on whether the right standards are being adhered to – that's a continual process and to be an effective regulator we need to be sure that they are world experts in that area.

Kevin

The frequency of inspections – that's the question.

Tony Almond – HSE

Site inspection is part of our regulatory regime but it's not the only part of it. As Jim described earlier a large part of our regime is to ensure that integrity is preserved and we do that through looking at the design and construction and operation of the well throughout its life.

Balcombe

The HSE never inspected at Balcombe and we have that through Freedom of Information. It was a peaceful protest. You could easily have got in at any time. You never came unannounced – you didn't come for three days.

Kevin

This group would be very happy to hear any written evidence you want to submit and we'll take that into account.

Lord Young (Tony)

I'm just really responding to this business about tremors. We have got the world's best regulation. 0.5 on the Richter scale and they stopped drilling. Now you wouldn't feel the earth move at lot higher than that actually but at 0.5 independently inspected, there isn't any risk and that is the people who just don't want fracking at any cost, those that are suggesting this. We've got regulation that is so much better as was already stated. We don't have open lagoons. Going through the aquifer there's triple cased with concrete and steel so there's so much - my own words to describe some of the stuff that's put about is what I call fracktitious evidence.

Question from the floor

My name is (...) and I'm doing a hunger strike on the 17th across from Downing Street. We've heard all this. I've been to consultations with the EA at Driffield and Elswick. I sent people questionnaires. People quite honestly do not know what you're doing. The questionnaire has proved that. The question you couldn't answer was depleted uranium in your constituency – John Dewar said to me that down the well there would be 180 charges of depleted uranium. I've also got information for yourself and Andrea Leadsom – I've got two reports, one for yourself and one for Andrea.

Kevin

The Environment Agency – is it correct that you use depleted uranium in this process ?

Mark Ellis-Jones – EA

Well I haven't seen the report that the gentleman's referring to so I would be very happy to have a copy as well. But as I've said we're satisfied that any wastes that arise as a result of the hydraulic fracturing process will be managed sufficiently and properly by our environmental permits.

Kevin

We've now got two more witnesses – we have Doug Parr from Greenpeace and Richard Davies from ReFINE. Thank you very much for attending today – we very much appreciate your time. Can you just explain who you are, what you do and the interest you have in this particular activity.

Professor Richard Davies

I lead the ReFINE project which is an international significant project investigating the science behind fracking and the environmental impact from an entirely neutral and agnostic stance, so we publish papers on traffic, earthquakes, contamination, emissions – pretty much every topic you would probably be interested in round this table. I lead that project – it's an international project and I'm very pleased to answer as many questions as I possibly can.

Doug Parr

I am the Chief Scientist for Greenpeace UK international pressure group. Notwithstanding the Chair's opening comments we are coming to the issue of unconventional hydrocarbons through the lens of climate change at a time when even under a 2 degree scenario we would already need to leave gas existing reserves in the ground with the Paris agreement suggesting well below 2 degrees centigrade temperature rise 1.5 degrees. Clearly even within Europe even more gas is going to have to be left in the ground that we that we already know about and it's an existing reserve and so we don't really see the point of extracting more. That said we have taken an interest in the regulatory arrangements and I'm quite happy to answer whatever questions you want to put within my ability.

Kevin

Professor Davies – one of the key aspects I think of the process if it does go ahead is monitoring the outcomes, monitoring the effects, monitoring the effects on water quality, on air quality. What's your perspective – have we got the right regime in terms of regulating shale gas and our ability to monitor the result which may cover some of Mr. Parr's concerns around climate change based on these admissions of other unintended consequences.

Professor Davies

As you've heard from previous speakers there's lots already in place – there's lots of rules and regulations and things that have to be done by the HSE and Environment Agency etc. I don't think we are totally there to be absolutely and I can tell you why I don't think we are totally there. For example, I'm going to give you a couple of areas where we've been monitoring and that we're interested in. There are 2,100 wells onshore in the UK already drilled over the last hundred years. I'm not convinced that long term monitoring of those wells is in place. We've gone and monitored them – we've gone and looked at a hundred or so wells to see if any of them are leaking. We found around 30% of those wells have a low level leak equivalent to natural flatulence from a couple of sheep that are grazing the land. So in other words it's tiny but that monitoring wasn't being carried out and it took us to go and do it and find out that's it's so small to be really negligible.

We are also monitoring gas pipelines, the National Grid high pressure pipelines to see if we can detect leaks. We're detecting very small levels of leak probably from connections between pipes. So that sort of thing isn't in place yet and we feel although we're finding our way it turns it's not particularly significant. I think there's still more to be done. The key thing is although they're small amounts of leak we can't ever rule out a Black Swan scenario that something does go spectacularly wrong. Unfortunately with any extractive industry or any industry of this scale that can't ever be ruled out so we still feel there are gaps to be filled. What we are doing about that – we plan to launch a significant project called Smart Shale which we put a bid in to MIRC, one of the research councils on this for around £5m. Smart Shale would provide the world's best monitoring system of shale gas monitoring everything from emissions, traffic, seismicity, air quality, water quality and then stream that information back to the end users – the end users would be people like anyone from Greenpeace to DECC to the Environment Agency and by doing so we can actually provide firstly fantastically important information, listen to the environment (because we haven't done much fracking) listen to the environment - what's the environment telling us and then that should provide the wherewithal which of course would be significant where Whether it's China, India even North America could benefit from that sort of advanced (...) There's still things we need to listen to – we don't know enough about the environment and how fracking can impact it and I think we could do more to do that monitoring hence the Smart Shale project.

Kevin

Should there be a lead regulator or is it fit for purpose in terms of having these different regulators?

Professor Davies

I can't comment on that – I really feel that's going outside my scope of doing basic science. I'll do the basic science, we'll put it to the regulators that are in place and the checkers and they can make up their minds on when they feel they can deal with it.

Lord Young

On the last contribution I welcome it – it sounds like a very sensible idea. I mean there is apparently monitoring anyway but the idea of having it available so that we are not existing in a climate of accusation and counter accusation – that we've actually got a factual record. I also welcome the statement - I knew that there was some methane contamination from old wells but they're nothing to do with the current fracking industry. The last comment I want to make is on the one from the gentleman from Greenpeace who said we're going to leave gas in the ground. We're going to leave UK gas in the ground – I don't think Greenpeace care about the world climate and ecology.

Let's be clear, as the Minister said previously we're going to be relying on imported gas probably for about 80% of our supplies somewhere between the next thirty and fifty years. So the idea somehow that if we don't tap UK – oh that's alright then, we'll just ship it in from elsewhere or pipe it in from elsewhere. I too would like to see a scenario where we're reliant on renewables etc. but in the meantime there is no alternative, we will be using gas to generate electricity to heat our homes. And it's absolute nonsense to say we're going to leave it in the ground.

Doug Parr

I will answer that question at considerable length in a moment (not that considerable). Let me just tackle your first opening question though about water and air quality monitoring. Firstly it is absolutely appropriate under the circumstances that the externalities of an industrial operation like this should be carefully monitored and that effectively the potentially damaging impacts- the costs of that should be internalised 1.21.43 by the operator. We've heard that the quality of regulations in the UK – that it is the best regulatory environment in the world – the best regulations in the world. I don't know whether that's true or not actually. It's often stated – I'm not saying it's not true I just don't know what criteria by which and how it has been established that we are the best regulator in the world. It's just trotting out a phrase.

At this point though, talking about regulators in connection with both air and water quality and indeed waste water monitoring – I would emphasise the importance of independent expertise within the regulator and that they are properly perceived to have that. I think the report that you mentioned in your opening question, Chair, about the Royal Society and the Royal Academy of Engineering point out for example well inspections and an independent well regulator is appointed. It sounds good but actually that could be from another company or even a different section of the same company. Now I hope that's changed – I understand there's a process in place there. But in order to do that we have to have the expertise sitting within the regulator that can manage and cope with this. Now a study from the States said that 7% of oil and gas wells had well integrity issues. Now that doesn't mean they were leaking – not at all, but that does show that there is some way to go to establishing absolute best practice. Finally I would say on our water quality, we would welcome the ability to monitor just how well such monitoring is being implemented on the ground because some of these questions arise on the ground rather than being ... statements rather than policy (...)

If I could come to our friend's comments about security. Firstly the think tank E3G established that of any likely scenario, the impact of European gas – we are in a European gas market of shale gas extraction across Europe is likely to be in the order of 2-3% probably by 2030. Now there are plenty of things that we could do that are not being done that could affect our gas use within Europe and within the UK. So I find it a little bit bizarre this emphasis on fracking as a route to security when there are so many other things that could be done. I'm not going to go into them now but I'm very happy to.

If you are looking at it through a climate lens, gas is going to have to be left in the ground. The only question is where's it's going to be and one thing the shale gas industry has never been able to explain is if the UK starts to exploit its own gas what gas elsewhere in the world is going to be left in the ground? This is a global issue we're talking about.

Lord Truscott

My questions for Dr. Parr. Earlier the Minister was quite dismissive about scientific reports that are critical on fracking. Do you think a regulatory regime could be devised which could fully mitigate the risks of fracking and in your view what sort of form should that take?

Doug Parr

It's difficult to say whether it could fully mitigate because fully and completely over long periods is a very long time and a very big claim. We can say that there are things that could be done in addition to what is already being done and particularly one of the areas of concern is around waste water and the use of the best available technology or at least the availability of treatment for waste water, mandatory environmental impact assessments, particularly for those well pads that are under (...) We don't think that the definitions of fracking are appropriate given experience in the UK (...) We also don't think that the protection only in special protection zone one for ground water is appropriate – it should be wider. If ground water becomes contaminated why is 50 days the threshold for use? In the first case there shouldn't be contamination altogether because cleaning up ground water can be a very difficult process to go through. And we also think there should be – picking up on the earlier conversation – we think there should be unannounced inspections. So I think in answer to your question I don't know but you sort of see where you are and where you can go.

Professor Davies

I think we could do more and we're doing some of this so the Infrastructure Bill says no fracking in within a 1km of land surface – that's basically what our research is saying. The tallest fractures that we know of is 600m high and therefore if you're 1km up you're probably in good shape. Although it was based upon US data we need to listen to the environment in the UK once fracking to see if that is overly conservative or the opposite way round. We're also doing research - to answer your earlier question - about seismicity. Wouldn't it be wonderful if we could say that we can predict or say there's a safe distance when thought it would be safe for fracking. Wouldn't that be great if say it's 1km we could model it, use empirical data i.e. historical data from other parts of the world. So there's just a couple of examples where I think there is more science to be done – I would say that as I'm academic, there's always more to be done. But I genuinely do believe that we can keep informing policy and if we start listening to the environment through the Smart Shale project we will have our own data base to say actually that's too conservative or too lax and try and get it as good as we possibly can.

Baroness Young

Doug very kindly highlights some of the areas where he thinks more can be done. If I could ask Professor Davies: if you take that list of impacts that the Environment Agency listed in their original report, where do you think the science needs to be beefed up and is it as good as it should be ?

Professor Davies

That's a vast question. What we need to be clear on is what elements of the whole process of fracking, every piece of that, are going to have the biggest impact and I think there are some very good questions, for example around the carbon footprint of the shale gas industry. Is it better that we have an indigenous shale gas industry versus LNG. How do we add up the impact of LNG versus having something local in our own community ? So that's the carbon footprint – what are the true cradle to grave conditions from this industry versus another way of getting that sort of energy source and that will help inform energy policy and blend of how we decide to power the country. That's one.

The other thing I think on my list is the tricky stuff to measure – the very long term insidious things that aren't clear to us – we can't see it happening – but what is the long term insidious impact on the shale gas industry – very difficult to determine that. So we are even now at Newcastle University research into the health impacts – can we work out what pathways there could be for toxic substances and what impact would those toxic substances have if they reached anyone.

So I think the health stuff is fascinating, I think it's vast and I struggle at this moment in time to see how exactly we're going to do that with the resources we have. So insidious long term things and I think also carbon footprint questions are good to try and tackle. Lastly the big one is – is there a Black Swan scenario – is something we couldn't have predicted that something in the UK, some combination of factors means we do actually have one of those bad incidents that we know can take place. We know there are unknowns out there but how can we spot them and make sure they don't happen.

Tom Elliott

This is actually a follow on to Professor Davies' last point. We heard from the last presentation as well ... things do go wrong. Can you protect from those big aspects if they do go wrong. Is there a general acceptance within the fracking industry and the fracking process that things do go wrong?

Professor Davies

I don't represent the shale gas industry, you realise that. Let's take the UK example of things going wrong. There are 2,100 wells. We have now measured 100 of them and found out that the leaks are equivalent to the flatulence of sheep that would have been grazing the land anyway. There has been one small blow-out (we know what a blow-out is, we've heard about it in the Gulf Mexico) near Doncaster in the early eighties, out of 2,100 wells. I think the industry does know things can go wrong - Piper Alpha, the Cullern Report, Gulf of Mexico, the Congoi . I worked on a huge disaster in Indonesia which led to 40,000 people losing their homes. These are very unusual events but it would be ridiculous to say that any of these processes is 100% safe – there's always things that are difficult to predict in the sub-surface. So we can't rule out all of the risk but you can I think try and understand as full as we can possibly do. There are 20 years' worth of data from the US that they are willing to provide to us through various forms and we can also listen to the environment so that if we do spot things, small things perhaps that a larger than a 0.5 earthquake and we think that's a bad sign – we can learn from that as well.

To give you one last example, BGS has monitored earthquakes in the UK since the 1970s so we actually have been listening since the 1970s – we can see which holes have historically been moving. The good news is that we have very few manmade earthquakes at the moment because of the reduction in coal mining. We have 40 years of data to put any new activity in context if we started to spot things that shouldn't be happening.

Lord Young

I was interested in that toxicity. Our regulations are much more restrictive on what can be used. The current proposal is something like 99.5% sand and water – I think that silicon is dangerous - well don't keep children off beaches. (...) can be used to bathe contact lenses, so it doesn't sound too toxic. I was a bit puzzled about toxicity. In the UK environment and in terms of either water contamination or tremor, well the Environmental Protection Agency in America - which sure you would agree is a tough agency – looked at 38,00 wells and found little or no evidence and that was in an environment which is a lot weaker than our current environment. So I agree that we should be careful about possible long term effect but we also should compare like with like and look at the nature of our very stringent environmental controls.

Professor Davies

So let me just say a little bit more about that. What we are actually doing in that piece of research – part of it is to look at pesticides that the agricultural has used and now in water supplies, and look at how soluble those pesticides are because they are very similar to biocides that are used in fracking so we can actually use again UK data to look at how those pesticides move from where the contaminations occur to another location. How movable are they and how soluble are they. And we have been doing a study on that where we've monitored 13 different pesticides, very similar to the sort of thing the fracking industry would want to use as a biocide and use that data to see how fast it moved given the fact that contamination took place here and we've got a monitoring well there. But I'm not saying there will be exposure – what we want to find out is if there was what would the impact be.

Question from the floor

If the risk was so great in terms of climate change should we actually continue.

What does science say ? Obviously they could benefit from further research, particularly into the carbon footprint of fracking. The information I have and everyone is welcome to it, is that the top scientist is now say the fracking footprint is outrageously dangerous the amount of methane released.

Doug Parr

There are two dimensions to this. One is the carbon footprint of production and what is assumed. The second is the level of leakage of methane because as we know methane is a much higher and much more powerful greenhouse warming gas than carbon dioxide that would result from it being burnt, and thirdly there's the market dynamics which would dictate about if gas is discovered and starts to be exploited what would happen elsewhere in the world. Now if - and it is an if because there still needs to be monitoring in this - if there were low levels of leakage from fracking probably the carbon footprint of locally fracked gas would be lower than that that is imported. I emphasise that there is a big 'if' around that. But it does not answer the question about what happens elsewhere in the world because when new reserves are discovered and there is a financial, commercial and political interest in exploiting them, that is true everywhere in the world and therefore you create effectively another lobby for gas exploitation and use hydro carbon exploitation abuse.

And these are not easy things to deal with because, as has been identified by the UK ERC and I think it's going to be identified by the climate change committee when they give report on that – it's actually quite difficult to start an industry and close it down again.

Kevin

Professor Davies ... is about monitoring the outcomes of the emissions that Doug Parr is concerned about

Professor Davies

Absolutely, so we're truly trying to help Doug answer his questions or help anyone else answer their questions. So we set off with no pre-conceived idea about what or how many (...) emissions comes from a well in the UK or how much comes from the pipeline infrastructure and we are now measuring them systematically using hi-tech equipment. What we found is the emissions are at the moment miniscule – they really are tiny. We didn't know that was going to be the outcome but that's what we found. So our historical drilling activity seems to be having minimal impact on the UK to date.

In the US it's a bit different. They have something called superintus (?) Particular operations, particular moments in time in a drilling or a fracking operation where they do get significant emissions of gases, they get emissions of VOC (volatile organic carbon). Now we haven't found that yet but we haven't got the shale gas industry as the Minister mentioned earlier on. So at the moment it looks like these emissions that we have from historical drilling industry are tiny. We need to listen to the environment if we start doing this operation and check that the regulations we have are fit for purpose. Until we start listening to the operations we won't fully know the answer to the exact question we've set ourselves.

Question from the floor

In the previous session there was some discussion around (...) and gain some confidence from that. Is your view that the emissions, for example, (...)

Professor Davies

There is research being done – Dr. Grant Allen, who is at Manchester University, hires a plane every so often to fly over the North Sea and over the UK through government funding and he can actually detect emissions from platforms and pipelines from the infrastructure offshore. There was a report done in 2008 around wells that have some evidence for an internal leak – not a complete leak but some sort of internal leak and I can't remember the exact statistic but it was around 10-12% of wells randomly selected had some evidence of internal leaks (...) but something internally that leaked in the well. So let's keep our eyes on it. With the best will in the world there will be emissions offshore in the North Sea I suspect right now.

Question from the floor

I just wondered if there were emissions if you think they are well represented at the moment ?

Professor Davies

I think there is research in place. Dr. Grant Allen of Manchester University had papers published and using planes to fly over and to watch these emissions take place as they occur so I refer you to this research.

Doug Parr

I have nothing to add to that except also the obvious which is that offshore inspection of abandoned wells is a bit tricky and time consuming and an expensive process so with the exception of what's been cited by Professor Davies I don't think there's much going on.

Question from the floor

This is really just to inform that each individual well will have one million gallons of drinking water that will be turned to toxic waste. 9.5% sand and it's (...) particular sand that can get into children's lungs and it can cause cancer. There's 5,000 gallons of chemical per well so we need to know what chemicals are going to be in there.

Professor Davies

I don't know exactly what's going to be in the wells. To answer the question fully I refer you to Frack Focus web pages where you can get the rundown of chemicals being used by the United States. I don't think those chemicals are permitted to be used in the UK because I don't watch that closely enough.

Doug Parr

There is the Chem Trust report. Let me just emphasise the policy from there which is that there needs to be full transparency of what is being used and that I would emphasise that in terms of environmental hazard of flow back water which would contain not only the chemicals that were used in fracking but also naturally occurring regular activity (...) etc.

Kevin

Thank you very much to everyone for attending. The session is now closed and I look forward to you hopefully joining us at our next session which we think will be 7th June but we will confirm that in the forthcoming days.