Northern Ireland Assembly

Committee for Enterprise, Trade and Investment

OFFICIAL REPORT (Hansard)

Shale Gas Exploration: Tamboran Resources Ltd

28 June 2012

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:
Mr Alban Maginness (Chairperson)
Mr Daithí McKay (Deputy Chairperson)
Mr Steven Agnew
Mr Gordon Dunne
Mr Phil Flanagan
Mr Paul Frew
Mr Patsy McGlone
Mrs Sandra Overend

Witnesses:

Dr Tony Bazley	Tamboran Resources Ltd
Mr Richard Moorman	Tamboran Resources Ltd
Mr Karl Prenderville	Tamboran Resources Ltd
Ms Lisa Rollins	Tamboran Resources Ltd

The Chairperson: Briefing the Committee today are Mr Richard Moorman, the chief executive of Tamboran Resources Ltd; Lisa Rollins, its director of corporate communications; Dr Tony Bazley, the director of environmental and community affairs at Tamboran; and Mr Karl Prenderville, its commercial director. I welcome you all to today's meeting. I am pleased to see you. Thank you for your printed presentation to the Committee; it was very useful. I ask you to make an opening statement, and we will then go to questions and answers. Thank you very much indeed.

Mr Richard Moorman (Tamboran Resources Ltd): Thank you, Mr Chairman.

The Chairperson: If you want to introduce your colleagues, feel free to do so.

Mr Moorman: Super. Karl Prenderville is our commercial director and is based in Dublin. He has worked extensively in Ireland energy and got his origins working with enterprises that discovered Corrib.

Lisa Rollins is our director of communications. She comes to us from Canada, where, for the past 10 years, she has worked in the unconventional business with communities directly, helping them to try to understand what is essentially a complex business. Tony Bazley is our director of environmental and community affairs. He is based just south of Belfast; he is a long-time resident of Northern Ireland and was a director of the Geological Survey of Northern Ireland (GSNI) approximately a decade ago. He has extensive experience in geology, earth sciences and conservation. I have worked for approximately 20 years in oil and gas, the past decade of which has been in this type of unconventional gas product.

I think that everybody will have the presentation. My understanding of the format is that we will go through the presentation, and questions will follow. The paper is, of course, primarily intended to be a reference document for today's conversation. We have made probably nearly 100 different television, radio and media appearances in the past nine months. Our information is very widely distributed, so we will not dwell too much on what is specifically in the papers.

I want to give a quick overview of the company and talk a little about the importance of a project like this so that we can really understand the environment. It is a widespread project as opposed to a single-site project, as would be common in a mining operation. We will talk about what we have been doing in the past year and a half and what we think we will do in the next year and a half. We will talk about some of the other issues that are related to the project and that are important concerns that have been raised about this kind of project along the way, and, really, around the world.

To give just a quick overview of Tamboran, we are a globally focused company. We have acreage rights in multiple countries right now — four altogether. We continue to pursue additional positions. Australia is probably our biggest area, by virtue of our having three basins and 13 million acres. Ireland and Northern Ireland, together in one basin, may make up our smallest area, but it will be very influential because of its access proximity to markets, whereas our Australian operation has to go to its market, which is Asia.

We are staffed primarily by a management team that has extensive North American experience. This kind of project is very new around the world, so, first of all, technological challenges need to be solved in each new area. That is because 100 other companies have not solved them yet, so when we go into new areas, we need people who have that experience. Secondly, there are immense personal challenges. Whenever you go into new areas, you are dealing with populations that have different levels of experience with oil and gas internationally. Again, people who have a lot of early stage experience are much more familiar with what people have gone through in the past when oil and gas first showed up in their area. So, that is our intent with the team. The rest of the information that we provided on that is self-explanatory.

We have provided a map of our areas. As you can see, we have a concentration in Australia. Our founding parents, if you will, are four Australian fellows, who, about four years ago, had the idea that what was happening in North America could reasonably happen elsewhere, given that the unconventional business was bringing a tremendous amount of natural gas to the rest of the world. So, they set out to acquire acreage, and, approximately one year ago, they began recruiting me and the team that you see before you. We have 22 people altogether right now. We have a new person starting in Northern Ireland on Monday, so we are very excited about her arrival. She will help us to gain a better understanding of our communication needs, especially in Northern Ireland.

I draw members' attention to the map of the shale-based rocks in North America. Without doing any of the hard math, you can see that the shales take up a tremendous amount of room in North America. Their dominance means that they have contributed significantly to the energy equation in North America. As a result, that has inspired a tremendous amount of activity there. Between 25,000 and 30,000 wells are being drilled a year and fractured — fracked, if you will — with high-volume horizontal drilling techniques. From that standpoint, the map is a demonstration of how much is going on, and it shows how much experience our team has had in those basins.

We demonstrated in our papers the lease boundaries in aggregate. Although we are talking specifically to Northern Ireland today, the basin obviously straddles the border between Northern Ireland and Ireland. The lease outline is what has been granted on either side of the border by the respective agencies for each country. That is intended to be an outline of the entire basin. In slide 6 there is a 3D image of what the basin looks like, which we have thanks to the extensive information that has been collected over the past 50 years. In December, for the first time, that information was put together in one image. As a result, we have a very good understanding of the entire shape of the basin, and what you see is that it is a deformed bowl: it has edges that come to the surface, where it is red, and the deepest parts are blue. That is important, because it helps us to understand where we need to be, which is in the centre of the deepest part of the basin.

More to the point, a tremendous amount of information is already available about that basin. Thirteen wells have been drilled in 50 years, and five were fracked in 2002 after being drilled in 2001. So, a lot of information has been gathered about the sandstone layers in the basin, but, until last year, very little had been done on the shale. In the past decade, shale has become very important as an energy source. With the work done by Core Laboratories on our behalf late last year, we were able to put a

lot of information together about the shale for the first time in Ireland's history. We were able to bring that forward in our annual report in January, which resulted in a press release on 1 February.

Slide 7 simply shows a slice through the middle of the basin. The different colours denote different formations. They usually take their name from where they appear at surface, so the rocks of Bundoran shale actually appear near the town of Bundoran on the coast. Anybody who wants to learn a lot about the shale starts by looking at where it appears at surface, because the quality of those rocks is remarkably similar to what you will find throughout the basin. There will be some slight differences. Anything near surface, for example, has probably been weathered, and any oil and gas it contained would long since have left, which is why you need to go deeper to understand. So, the past work has been concentrated on the sandstones, and, as part of our proposal, we will concentrate on one sandstone and especially the Bundoran shale.

Slide 8 is about understanding the environment. These projects are different to traditional oil and gas projects because they result in a greater density of drilling. Whereas it was not uncommon to have a well every mile or so in traditional oil and gas operations, it is now not uncommon to have eight or more. There are projects in the United States that have in excess of 100 wells in a square mile depending on the nature of what is underground. That kind of impact, therefore, is unavoidable in these kinds of projects: you will have a surface impact. Your job is to understand how you can minimise that impact. Can you minimise it enough so that the project can fit into the environment it is in? There are some environments where that is not possible. For example, an entirely urban area should not be able to tolerate that kind of development, but other areas perhaps can. That is why the environmental impact assessments (EIAs) are so important. We have to, first of all, seek solutions that make it possible for the project to be evaluated in its environment and then assessed as to whether or not it is suitable for that environment.

Slide 9 simply shows the gathering system put forward by Bord Gáis. You will see from the slide that the majority of the island is covered by infrastructure. The area of the project, interestingly enough, is so underpopulated that there is not justification today for a gathering system in the north-west. We understand from the regulatory authorities in both countries that it is a desire to go in that direction and supply local people with the benefits of natural gas, but, again, that will be under their jurisdiction. From our point of view, if we bring a project forward successfully here, it will be quite easy for us to make a connection into an existing market. That is very attractive. We do not define how those connections happen: that is up to the authorities that guide those aspects of gathering and distribution.

On aggregate, the island imports 97% of its natural gas and some 95% of everything it burns, such as oil and gas. Those things are fundamental to society today. It used to be that oil was a measure of the modernness of a society; today, thanks to our digital world, it is electricity. Now, 60% of Ireland's electricity comes from natural gas, and it has come within hours of not having natural gas in the past few winters.

In the past year — 2011 — we were awarded the permit after a competitive bid round. You are probably more familiar with that as companies submitting their work programme to outline how they would improve the project. We have had extensive meetings with regulatory, planning and council officials. We held substantial community meetings; about 1,100 people attended. One, in Carrick-on-Shannon, went on for almost five hours. We had very good community support from our chairman, to be able to keep a crowd interested in talking for five hours. We have had significant media and conference participation. From day one, we have made very clear that Tamboran will be a transparent company, which means that we answer everything. It may get a little more challenging as we turn into a public company some day, but it is our job to be transparent.

From the data point of view, we have already talked about what has been done. The respective groups that have worked on it are there. Our facility design is at an advanced stage, but I should be clear that that is a global facility design; we will use that everywhere in the world. Although Ireland is important, it is still only about 0·3% of our acreage. That design will be used extensively elsewhere. In 2012, we continue to study the geology; 13 wells and hundreds of thousands of acres is a lot of information to go through. Tony, working with environmental consultancies SLR and Tobin, has developed a scoping document of our EIAs. As soon as we have confirmed where the sites are that are appropriate for our EIAs to begin with, that will go to a complete public distribution. All those essential agencies that are part of that will receive that. We also have the policy of who else needs to know. Basically, anybody else who wants to see that document will be welcome to, and their comments will be welcome.

We are trying to find sites in south-western County Fermanagh. It is not exactly an active land market; it does not turn over very often. From that standpoint, we are trying to find which sites would be most appropriate in terms of distance from landowners, access to decent roads and access to good power systems, because we are going to use electrical equipment to minimise noise. As a result, a lot of criteria go into that. We are in the middle of trying to identify lands, and we will then approach the landowners, whether it is state or private, or sale or lease land. Once those sites are selected, you can do a site-specific EIA. Until they are selected, we cannot begin that 12-month process. Until that 12-month process is done, we cannot move forward with a request for planning permission. Some time this year, we hope to have planning permission. We hope to have the organisation to drill a sample well deep into the centre of the basin — that has never been done before — to extract a 500 metre by 4 inch or so diameter core in 9 metre increments to give us a comprehensive understanding of every bit of rock in the centre of the basin. That will help to define, once and for all, whether the project is viable.

Slide 12 covers the EIAs, which I am sure you are all very familiar with. The main point is that that tool is barely in use in North America in any capacity. If it had been in use, it would have prevented some of the unfortunate things that occur when operators come into areas and do not understand what they are doing. The process is, of course, universal in Europe, but it will make a big difference to that type of work around the world. If we stay on some kind of schedule, we should have our EIAs completed some time in mid- or late 2013. We will then request planning permission for up to five wells sequentially as an exploration test to demonstrate whether the formation can be, as we anticipate, cracked effectively and whether it will produce enough gas to pay for the cost of the wells. The wells will cost between $4 million and $5 million initially. That is not a small undertaking, but they are the first steps in understanding what is necessary. If there are positive results from that programme, we will apply for a development-style programme, which will probably consist of another couple of years. In a perfect world, we could see something like 2016 as the beginning of commercial efforts, but, again, there is a lot to do between now and then, and a lot of discussions to be held beyond these walls.

The rest is pretty straightforward. I will add some comments on the community investment fund. In Canada — my home country — like Ireland, Northern Ireland and most countries around the world, the state owns the mineral rights. In Alberta, that is OK, because we drill every corner of Alberta. Everybody shares in the benefit and everybody experiences the impact. In a place like Northern Ireland, it will be limited to south-western County Fermanagh, so you would be effectively asking a local community to take some impacts on behalf of the country. It is our feeling that the fund must be established to compensate for whatever happens in that respect — replacing roads, enhancing sports and definitely building up the business sector in that area.

Slide 14 shows the crux of everything that we do. With almost five million wells drilled worldwide, it is a universal challenge. How do you drill a well and protect the groundwater? It does not matter what you do in the well; if you have not protected the groundwater with a surface casing and cement, anything you do in the well puts the groundwater at risk. Fracking is simply the latest step in that direction, it is simply higher pressure. The pipes are rated for 60,000 psi at a minimum. Fracking does not even touch those kinds of pressures, so it does not change the fundamental need to build your well properly, regulate it, assess it and make sure that operators are following the rules. In the United States, they do all of those things, but they do not check their work. They are not required by law, for example, to verify that the cement has integrity before they begin any operations in the well. As simple as that sounds, it is not a law anywhere in the world today. From our point of view, that should be changed.

Slide 15 shows the current design of our well pad. In the United States, because individuals own mineral rights, approximately 98% of the time, operators would be drilling a well on an individual's land. That individual wants that well; they are not interested in having a shared group of wells on somebody else's land. It is just the system. In the rest of the world, with state-owned mineral rights, we have the opportunity for much more efficiency with a central well pad. That is done in only a few places in North America right now in any kind of scale. In north-western Canada we have operators currently drilling up to 26 wells, for example, on a single pad. The main thing it does is give tremendous efficiency through sharing equipment. Instead of bringing equipment in and out 26 different times — or, in our case, eight to 24 times — you basically do it once. The biggest change that we are making — and it is entirely owed to the environment that we are in — is that the water will be completely closed-loop on this system. It rains a lot here — twice as much per square foot as in Canada's biggest grain province. As a result of that, we know that our exploration test programme will be done entirely with rainwater. We believe that, in our entire programme, at least 50% can be sourced from rainwater.

We also know that, thanks to the innovations of the last few years, 100% water recycling, which is now common in several projects in the United States, can be done here, and it can be done chemical free, which is really important. The concerns that we have heard from people in the past year have centred on the issue of chemicals. There are others, obviously, but chemicals are very important to people. They do not understand them — why should they; it is not their business — but they do not want them in their environment. From that standpoint, things have reached that point, thankfully, in the United States. A company called Ecosphere is one of several dealing with that. It has recycled just about 2 billion gallons of water chemical-free in the last four years alone, and it will be our preferred supplier for everything we do here. It has done over 500 wells in the United States like that. Of course, all the equipment will be done with after less than a year's worth of drilling. I should add that drilling wells will normally take between four and seven days, and fracking will take about eight hours. So, each well has about a one-week cycle time. Over the course of a year, even a 24-well pad would go very quickly. All the subsidiary equipment can then be moved out and recycled for the next pad.

Slide 16 demonstrates how you can mitigate the effect on environments. It is very simple: it gets pretty cold in Canada, so we put buildings on pretty much everything. One of the benefits of that is, of course, noise reduction. In the southern US, it gets to 100°F, so they do not like to put buildings on stuff because it gets too hot. Unfortunately, that means that landowners are forced to live next to pretty noisy equipment. From that standpoint, we think that our approach will be to get a lot better at concealing and, especially, reducing visual impacts. In the long run, our pads will look like nothing more than eight to 24 5-foot sticks in a field, lightly gravelled, with a green barn in front of them. They are about 5-foot high and 6 inches in diameter and look like fence posts. That is what you will see every time you drive by one of our 80 to 120 pads, should all the approvals come together some day.

We have already touched on the issue of water resource. However, I want to make the point that in our peak year, as we currently model it in our press release from 1 February, we would see as much as 310,000 gallons of water a day taken from rainwater and from one or, maybe, two groundwater wells on each pad. That is equivalent to a small amount of the consumption here and a very small amount of Ireland's rainfall. It is sometimes hard to put water in perspective; so many parts of the world do not have enough. In Ireland, it rains, on average, approximately 700,000 gallons a second through the year.

Slide 18 talks about our commitment since last summer to use no chemicals in fracking. The drilling will be done with air until we get to the horizontal leg, at which point you have no choice but to use a fluid in order to lift the particles that you grind up. What we use is a clay-based mud system. Bentonite has been in use for 100 years. The main things added to bentonite are fluid-loss additives to prevent fluid escaping from the mud. It works in the same way as blood clots. It is designed to make sure that the formation does not take anything out of the well.

Slide 19 touches on our best practices. We talked about a lot of them here already. You will have questions about that, so I will not dwell on it too much. I guess point 3 is important: 3D seismic is essentially the imaging of the underground, like that bowl image that we showed earlier. We will conduct a full 3D programme. That was not done in Blackpool; it is now being done in Blackpool, but it should already have been done there, and it should be done everywhere. The US industry has learned that. I am worried that some of the new companies in the rest of the world are going to reinvent some of these wheels. The reality is that Tamboran has a lot of experience doing this. We know that there are some things that you simply cannot avoid doing. Plus, 3D seismic tells us where to drill. It is pretty silly not to use all the tools available to you.

The next point is about water jetting. That was hugely in use in the 1980s. However, in the conventional world of oil and gas, there were not many holes punched in steel pipes.

[Proceedings from 10.43 am until 10.43 am were not recorded due to technical difficulties.]

Perforations became simple with the use of shaped charges; maybe 50 in a well. On the other hand, an unconventional well could have hundreds of shaped charges. If you are drilling just one well a day, like most US projects, even a two-week inventory would use thousands of them. That is a major handling nightmare. In some countries, that is a major nightmare. So, our intent as a global operator is to make sure that we do not have that problem and do not put our people in harm's way. So, water-jetted perforations are the only way to go. That also allows us to eliminate hydrochloric acid to clean up the debris caused by perforating. We think that is a very good step forward. It is in use in many projects in North America now. In fact, there is nothing here that is not in use already, it has just never been brought together in one place yet. Oil and gas is a long business; it takes a long time for some

of these things to filter in. It is not fast enough for movies, but it is fast enough to make sure that new projects are done properly. I think that we have touched on everything else there. This team is, of course, very much engaged in stakeholder relations. However, I will be very clear: we do not solicit, and we do not ask people to like us. It is not that kind of business. Our job is to provide an essential commodity. We do not lobby; we answer questions, and we make ourselves available. Whenever people ask us for information, we give it to them. We have had just about 100 separate media requests; we never asked for one — as you can appreciate, this project generates its own news. We have turned down only a few, mostly because we are out of the country. We have held as many local meetings as we can. Right now, we are very focused on just trying to meet our obligation to the Department of Enterprise, Trade and Investment (DETI), which is to get the environmental impact assessment ready so that we can decide whether or not we ask for drilling permission. That is a requirement under our work obligations.

We communicate extensively with opposition leaders. I think that that is very important, because a lot of people get car wreck images and are then told that that is how we drive every day; they do not appreciate that there are 30 — *[Interruption.]*

The Chairperson: I am sorry about that, Mr Moorman. We are working on emergency power here.

Mr Moorman: I appreciate that; you have got some rain out there. I am from Canada — the worst thing that we get is some snow.

One of the challenges that we face with some of the opposition leaders is that they get a lot of information off the internet, which is not very good at putting things in context for people. Almost 30,000 wells a year are being drilled in North America, and 90% of them are hydraulically fracked. More than half the wells in the world each year are now fracked, and that number will only get bigger and bigger, because the conventional world is declining. Hydrocarbons are in their own form of twilight. Shale is probably it; so, as a result, it breathes some new life into some very difficult reservoirs. You would have an easier time getting gas out of your sidewalk than through what we try to do by cracking shale. From that standpoint, it is hard to put it in context when we are not used to the industry, so it is very much our job to try to put it in context. Lisa has been doing that for 10 years in western Canada, because, again, we went through the same experiences when the process was new there. I have personally had over 10 hours of conversation on the phone with leaders of the opposition; I assume you know that. We keep an extensive e-mail record of all our conversations; we have exchanged dozens of e-mails with all kinds of people who are negative to the project and who, sometimes, ask questions about it. The important thing for us is that, every chance that we get, we tell people what the real project is. It is not the same in every place in the world. It cannot be, because every place is different.

I will give some closing thoughts. It is a corporate responsibility to minimise physical and social impacts; it is very bad for business if you do not. We believe that a single incident in Northern Ireland would shut this project down, so it is very important that we check our work at every step in the process. Accidents will happen if people do not check their work, so that is very important to us. Obviously, the regulators will have their say, and they set the rules. Again, however, it would be very bad for our business if we did not do it properly. Cuadrilla is a prime example of that in the UK. Its plans have been interrupted heavily over the last year, its investors are concerned, and it faces challenges in the community that it did not have a year ago. I am not picking on people in that company; they are good guys, they try their best, but they did not do what they needed to at the beginning to mitigate some of the impacts that happen in this business.

We have to, therefore, make sure that we understand the environment, which is unique in each place. Best practices should come out of that; you can have your so-called best practices, but they need to respect what is needed in the community. In Alberta, a red barn is good; in Ireland, it would stand out pretty far.

The regulatory environment is very important; we have published articles across Europe, which probably one million people have read, talking about the need for regulatory authorities to step up, especially in the wake of 2008. People do not have a lot of confidence in their government or regulators sometimes, and, as a result, this is a real opportunity for those regulators to step up and show that they are protecting the public. They need to enforce better than they have been.

Of course, the economic benefits and the job creation that would result from this project are significant. Those are outlined in the appendix to our press release of 1 February. However, they can never come at the expense of the environment. Reasonable impacts are a fact of life. Most of us

drive to work. There is a challenge in how that is managed. There will be trade-offs, whatever they are. Some communities will not accept some trade-offs; that is also a reality. The bottom line for us is that, if we are going to be successful as a company that is doing this in multiple countries worldwide, we have to be transparent. You cannot not tell people what you are doing anymore.

The truth is that automobile and gas companies are just not good communicators. As Lisa reminds me, throughout our careers, we try to be really good underground, and we have only a handful of people who worry about how things fit together at the surface. In the past, people rarely worried about how others around them fit into that. That is unsustainable in today's world, and it is completely unsustainable as projects like this go international to parts of the world where communities have never experienced oil and gas. There is no reason why they have to experience the worst of it; they should experience the best of it.

Thank you for your time; I appreciate it.

The Chairperson: Last week, we had evidence from a group from Fermanagh that was very exercised about the proposal for the development of shale gas and the use of fracking. That group was obviously concerned and worried. It is clearly a very contentious issue in Fermanagh and, I think, throughout Northern Ireland, and, perhaps, Ireland as a whole. I want to point out to you that there is great concern in the community. The major concern is the impact on the natural environment, as well as the social impact on farming communities and rural areas. Therefore, a lot of work needs to be done to persuade the public, specific pressure groups and politicians.

I went through your submission, and I listened very carefully to what you said this morning. One thing that interests me is the net effect on the countryside of any development in Fermanagh, or, indeed, Leitrim, but Fermanagh in this instance. This is an intensive operation, and I think that people need reassurance that this will not destroy the natural environmental beauty of an area of the country as beautiful as Fermanagh. How intense will the industrial impact be, and what will the visual impact be on the countryside?

Mr Moorman: I will start with the visual impact, because, when drilling is completed, we think that it will be a very passive and quiet project. There will be eight to 24 wells on a single pad. In the end, those pads will perhaps be as big as 3 to 4 acres, if we are drilling as many wells as that. The majority of that space is taken up by empty space between the well heads, simply to allow space so that, as they are drilled down and spread out, they have no technical chance of running into each other. That is a safety precaution — for financial reasons more than anything, because you would not want to waste any efforts. We believe that we can manage the visual impacts quite readily, as it has been done in some very sensitive places around the world.

It is a similar case with noise mitigation. When you are taking the gas out of the ground, it is going to be at very low pressure. It will be like tyre pressure but twice that, at best. It is not a traditional oil and gas operation. Nonetheless, you will have to compress that gas in a few places around the field to get it into the normal operating grid. Compressors can be very loud, so you have to put buildings around them if you want to mitigate that noise. You can do all the usual things. Similar to putting a muffler on a car, you can put mufflers on compressors. You can put up sound baffles and plant trees and all those kinds of things so that nobody has to listen to the compressors. It is not required in most parts of the world, of course, but to address your point, I can tell you that we are talking about a very rural area. Although an acceptable standard in Ireland might be 45 decibels at night, which an urban dweller might tolerate, no one living in the countryside would tolerate 45 decibels at night at their residence. They are not used to it, nor should they be.

So, from that standpoint, we have to make those efforts. There is no question that they will cost money. However, again in the context of the project, if you cannot afford to make those efforts, you cannot do the project. So, from our point of view, that is essential. As you point out, people will not accept an industrialisation.

A certain amount of activity is unavoidable. When a pad is first constructed, there will be gravel loads. Gravel is laid perhaps three inches deep over a large area. However, to compare it with the North American experience, we can substantially reduce the traffic by using a multi-well pad. It is not an excuse for doing it, but the point is that the impact for each well will be approximately 10% of what is expected in North America. A closed water system also enables that. In my experience, the biggest problems in North America involve truck loads of water going into a lease and out of a lease. That is just ridiculous. There is no reason for it. My prior employer, for example, recycles water 100%, uses pipelines to move water everywhere and does not have that problem.

General industrialisation is, again, partly a pacing issue. If you were to try to develop this at twice the pace, you would have more of an impact on local people, given that there would be more trucks on the road, and, no matter what you did, there would be more noise because of those trucks. So, I think that pace is going to be very important to any accepted planning permission application. The project has to move at a pace that is acceptable to the community. The good news about the project is that it is extremely flexible. This is not like a mine that must be constructed where the minerals are. Given that we cover a large area, in the sense that perhaps 100,000 acres or more could be drillable, we have choices about where we work and the order in which we do things. So, I would say that no area of the project will actually be unduly influenced for more than a year through the drilling window. After that, it is a matter of simple production. People will drive to work, but they do that anyway. The roads will likely have to be —

The Chairperson: If I can just stop you there. You talked about having 60 multi-pads, which are your preferred option.

Mr Moorman: They are the only option.

The Chairperson: They are the only option?

Mr Moorman: It would not be, I think, effective —

The Chairperson: In the United States, you have single —

Mr Moorman: It is so common. The problem is the landowner situation. It is unique to the United States. We have a little bit of freehold in Canada.

The Chairperson: OK. That is 60 multi-pads and 24 sites, so that makes 1,400 —

Mr Moorman: Exactly — theoretically. Some of those locations will not be viable.

The Chairperson: You talked about roughly 7 acres for each multi-pad. Is that right?

Mr Moorman: That is correct.

The Chairperson: So, you are talking about 400 acres. What square mileage are those 400 acres spread over?

Mr Moorman: They will go over approximately 50,000 acres, which, I guess, is about 80 square miles. That is about 9 miles by 9, or if you are using kilometres, it would be about 15 by 15.

The important thing is that each of those pads would drain at least one square mile of land, which is 640 acres. So, for example, the drilling pad would take up 7 acres and, when reduced down to about 4 acres, would drain at least 640 acres underground. So, the relative scale between above and below ground is quite small. It is important that it stays that way. That is why the multi-well pads are so important.

Over time, we would hope to lengthen the horizontal laterals. In other words, we could actually drain larger areas underground with the same surface configuration. We cannot make those promises until people drill. We just do not know for sure how consistent the rock is to allow it to tolerate that. There are places in the US where you can drill for 3 or 4 miles underground. We cannot guarantee that, so we start —

The Chairperson: I know that the estimate of volume is purely that and that your exploration will provide more accurate figures, but if all the safeguards were satisfied and industrial production started, on the basis of your present figures and estimates, what would be the net economic impact on Northern Ireland and Ireland as a whole? Your figures relate to current consumption in Northern Ireland, which is reasonably low in comparison with that in the Republic and Britain. Can you give us an idea of what the net impact will be on the overall economy in Northern Ireland?

Mr Moorman: Certainly. The tax regime means that there is about a 7·5% royalty and roughly a 60% corporation tax on the profitability of the project. Presuming that we are profitable, as was outlined on 1 February, it would be almost £7 billion from that tax system. We estimate that roughly 600 jobs will be created by 2025. Some of those will fade out as the drilling rigs move away, but you will still have a minimum of 400 direct jobs. There will be side effects of that because of all the things that go with everybody who works on a location, such as maintenance, admin and human resources. All those things add up, I am afraid. The biggest part of a company is the accounting side. So, from that standpoint, there are substantial dollar impacts.

I will give you my thoughts on a business impact, but other people will have to make the decisions. Various figures have put it to us that a surplus of natural gas in Northern Ireland would increase consumption. It could cause businesses that currently depend on natural gas, such as fertiliser manufacturers, smelters and all kinds of hard businesses that generate real product from a natural gas base power supply, to move next to those facilities. They cannot do that today, of course, because all gas in Northern Ireland comes from Russia or the Middle East. You import through Scotland. The UK primarily imports almost half its gas from other countries and the Middle East. Europe imports 40%. However you look at it, your gas comes from a great distance, and, before it gets here, almost 15% of it is burned just to get it here. From that standpoint, there would be tremendous savings. A surplus of natural gas in Northern Ireland would eliminate the fear premiums that are inherent to markets whenever there is scarcity. We believe that prices would decline relative to European prices, and they would go down to the functioning European prices. Given that I think that oil prices will rise through our lifetime, natural gas prices in Europe will also rise through our lifetime. Everything that we can do to reduce energy inflation is really important to countries.

So, I think that those combinations will have a significant impact. It will be up to business to take advantage of the opportunity, but we can facilitate that.

The Chairperson: Apparently, we have some problem with the amplification of the microphones. The technical people can change those mics, so I will suspend the meeting for a couple of minutes to permit that to happen. I think that you can stay there. The meeting is adjourned for a couple of minutes.

Committee suspended.

On resuming —

The Chairperson: We will continue questioning the representatives from Tamboran. Mr Moorman has given evidence, but his colleagues can intervene in reply to any questions.

Mr McKay: Thanks for your presentation. In general, there is recognition that there is a lot of public opposition to the proposal. We have some correspondence from members of the tourism sector in County Fermanagh.

One of the most concerning things that I have come across has been the news story about Manorhamilton Enteprise Forum in County Leitrim being given €20,000 by Tamboran to build a hotel or to apply to build a hotel. I do not understand why you would do that prior to — well, maybe I do understand why you would do it. Do you understand why locals would regard that as an attempt to influence key stakeholders in the community prior to a process beginning that may see the development of this proposal? Some may call it, "bribery", and some of those who are more critical may see it as the equivalent of a brown envelope, but they may use stronger words to describe it. In what context was that money given? How many other organisations, community groups and key players in communities in Fermanagh and Leitrim have been offered money?

Mr Moorman: The Manorhamilton Enterprise Forum is a group of about 26 different businessmen in the Manorhamilton area. Some of them are representatives from large multinational companies that have operations there, and some of them just run the local pub, so it is a broad group. They actually approached us and have written 20 or 21 letters to different companies across Ireland. Manorhamilton has been without a hotel for almost 27 years, and their belief is that that is impairing business in the community. People just drive right through and stay in Sligo. They have worked at it for years and never got the funding, so they had the idea to approach us as well as other companies. We had already, by 1 February, published that we would undertake a variety of community funding initiatives. One of those categories will be business start-up and business enterprise. Many of the services that we need for the project do not exist in Ireland today. We will need local people to do that, but it is

going to be hard for them to get the money, so we are going to need to help them start businesses that help the project.

From our point of view, the hotel is a very good idea for Manorhamilton. If you look at our map you will see that we are bounded essentially by Manorhamilton on the left and, at a distance, Enniskillen on the right — the east side. There are just no major centres of any sort in the project area. We recognise that we are going to need a base of operations. If we are going to be training hundreds of people, we are going to need a place for that. We are going to need to develop a presence in both of those towns. We are going to have to have our own buildings, operations and yards and so on if we are to develop the project some day. So, when Manorhamilton Enterprise Forum approached us, we took that into consideration as a good thing for the area. It is ironic in many respects that people accuse our project of harming tourism, yet they thought to approach us to help enhance that in their area.

From our point of view, the €20,000 is to be used for preparation for the planning application. I do not believe it will fund them all the way. They have a site, which they have worked at already in the past. They were planning to turn it into a hostel, but they felt that that was not going to be adequate, so they wanted to upgrade that application and go further with it.

We have not been approached by any other groups for funding, nor have we approached any other groups, of course. We are not going to approach other groups for funding. When our community initiatives are rolled out, which we anticipate being either September or October this year, we will outline very specific categories under which people will be free to approach us. From that standpoint, we will be trying to support local culture and many of the things that we think are inherent to a community in which we would like to be an operator some day.

Sure, there are people who are opposed to the project and who do not want us to do anything in the area at all. That is their right. From our point of view, we think that we have to show our commitment to the community as soon as we can. That means that we cannot wait until we have drilled five wells in four more years. From our point of view, there is no reason why the community cannot start benefiting from that now. If our shareholders do not like it, they will tell us that, but, right now, I think they are very happy with our going ahead and trying to make it clear that Tamboran is a community company. We are not trying to run it like a normal oil and gas company, so I would tell people not to expect that.

Ms Lisa Rollins (Tamboran Resources Ltd): I will add one thing to that. There will be very clear and transparent guidelines and criteria for those funding applications. Those will also be rolled out in the fall. I really want to emphasise that fact. It will be a transparent process.

Mr McKay: You talked about Manorhamilton. I take it that that is the only offer of money you have made.

Ms Rollins: Yes.

Mr McKay: There have been no other groups in Fermanagh?

Mr Moorman: No, we have not been approached by anybody. The Manorhamilton meeting — I presume that the group has minutes to that effect — should be very clear, and we have made it very clear publicly that there are no conditions on that money at all. There are people on that committee who do not support the project.

Mr McKay: Do you think that, in general, they will be more likely to support your project now?

Mr Moorman: No; not judging by the comments that we got at the meeting. We were given the opportunity, as we have been today, to talk about the project. They wanted to hear more about it since we were there, and we wanted to hear their concerns. They are the business leaders of that community. They are the reason why many people have jobs in that community, so we wanted to hear their concerns especially. From that point of view, we are happy to be part of that support thereafter.

Mr McKay: In slides 27 and 29 of your presentation, the figures show the estimated daily gas production and the direct employment estimates over a 30- or 40-year period. The employment levels

remain static for the period between 2031-2049, as the gas production goes down. Can you explain that? I have seen figures for other areas, parts of the United States, where the employment has dipped, so why would that not be the case here?

Mr Moorman: That is a good question. The situations you would be looking at in the United States would be a case of, often, thousands of wells, and those wells coming offline. So, as the wells come offline, the jobs to look after them go offline. In the case of a shale project, it is like a balloon that is opened at the end: in the beginning it blows out fast and, as the wells lose that gas volume, they blow out slower and slower, forever, until the price of gas does not pay to keep the well on. How long that will be is unknown, of course, but we are very comfortable that it will be past 2050. So, as a result, the well count actually stays constant from that time period. There might be a few that blow off, if you will, and do not produce any more, but, even then, the well pad will still have all the same equipment, and there is still the need for three operators to be on site 24/7 to make sure that nothing goes wrong. That is why that job figure stays constant.

Mr McKay: You said that you will create up to 600 direct long-term jobs for local residents by 2025. Have you made any projection or done any work regarding the impact the other way, in terms of tourism? Tourism groups are saying that jobs will be at risk because of this. What research have you done on that?

Mr Moorman: That is not being done. The environmental impact assessments have several socio-economic categories, and tourism is a big one. The work that will be done there will have to be subject to planning permission review, to see whether it is an intelligent assessment. From our point of view, we believe that, with the right investment and the right requirements, this project can have no impact at all. In fact, we would hope that the presence of hundreds more employed people in the community would drive up economic activity in the area, and that would have a ripple effect and a net benefit. We do not see it harming tourism.

I can only point to cases in other parts of the world: Alberta has a very extensive tourism industry, and they literally drill every corner of the province. So, I do not feel that it is a risk. Now, if an operator is careless, bad things happen. So, it is very important that the rules are there, that the rules are enforced and that, if impacts emerge, something has to change.

Mr McKay: But, by that stage, it will be too late.

Mr Moorman: I do not think that anything is ever too late.

Mr McKay: You referred to other areas, particularly in Australia, where you have areas that are to be developed and, perhaps, have been developed. What stage are they at? How many of those have been fully developed? What kind of reaction did you get locally? Have there been any adverse effects in those cases?

Mr Moorman: Our operations in Australia are very similar to where we are at in Ireland; there is a lot of initial work being done on existing drills and on trying to understand the basins. Like Ireland, there have been many wells drilled there over the past 50 years. So, we have not done any new drilling, we are doing the same thing: studying what has been done and trying to understand it in a modern context. Australia has had, I would venture, maybe six shale drills in the past two years. The process is just beginning there. Similarly, there is only one completed well in the UK and, I think, three drilled.

Mr McKay: Was there much public opposition?

Mr Moorman: No. In the shale world, in the Northern Territory, there is not the density of population that you would expect in parts of Europe, for example. Ireland, where we are in this project area, is just about the least populated part of Europe, but Australia is even less populated. We held lots of community meetings. As part of getting your licences in Australia, you have to have approval from the traditional owners, who are Aborigines. First, you have to find them. It has taken us just about three years of conversations to get those leases granted, with 50 signatures roughly on each block. It takes a very intense effort from the public side to even find the people who have a say in what we do.

The important thing in Australia is that the process is exactly the same, and it will have to go through its own impact assessments. Of course, there will be a lot of categories that do not apply there.

Mr McKay: Last week, we discussed the possibility of a public inquiry. From the Committee's point of view, and the point of view of the public in general, this is new technology to Ireland, and this particular type of fracking is new internationally. We should consider having a public inquiry to give all sides of the argument the opportunity to dispel what they see as myths or to firm up their arguments. Would you be opposed to that?

Mr Moorman: No; we are open to any steps. We do not make the rules, we follow them. We can give our best advice on complex issues that we think we understand, such as the checking of the cement, because we do not believe that regulatory authorities go far enough in enforcing some of those things. That is our opinion, and other companies might disagree. We are open to any kind of public discussion that representatives believe is appropriate for the people they represent. From that standpoint, informed debate is really important. Context is hard to get in any new project, and informed debate is very important.

Nobody should deny that there have been problems in this industry, as in many industries. If people do their jobs properly and enforcement is effective, which is what this Committee oversees, I have no doubt that people will be responsible and will be held accountable. Public discussion can only be good.

We are not doing very much right now; we are doing the environmental impact assessments, which take time. We have not even got a physical operation under way, short of grabbing some surface samples by the beach late last year. We respect that there are lots of people with concerns, and we also understand that there are people who just do not want projects like this to go ahead. The sooner a discussion like that, which could benefit people, happens, the better all round.

Mr McKay: If the Department or our Government were to decide that physical operations should not begin until such an inquiry has taken place and those concerns have been dispelled, would you be happy to abide by that?

Mr Moorman: We would have to abide by that.

As a business that supplies what we think is an essential product, we want to bring that on as fast as we can. We know that it creates a lot of jobs and economic activity, but we also recognise that in the new world, the world outside North America, for unconventional resources, it is very new. We have done a million wells like this in North America and almost 70,000 with high volume horizontal fracks in the past decade alone. So, we are very comfortable with that, but I totally respect the point that you are making as a representative of people who have those concerns. We follow the rules. That is our job: we follow your rules.

Mr Agnew: Thank you for your answers so far. In its disclaimer in the presentation that it gives to potential investors, Tamboran states:

> *"Tamboran Resources Pty Ltd, its officers, employees and advisers expressly disclaims any responsibility for the accuracy or completeness of the material contained in this presentation and excludes all liability whatsoever (including in negligence)".*

That is a recognition of what you have described as "forward-looking statements". So, it is fair to say that any projections about the amount of gas, the number of jobs created and the predictions of energy security for Ireland are all guesstimates. You are seeking investment, and they are best-case scenarios more than likely scenarios.

Mr Moorman: Some people are surprised when they see the disclaimer because they do not see corporations, for example. Every public company in the world on every single public talk must use a disclaimer for legal reasons.

Mr Agnew: I am certainly not surprised by it; I am just highlighting the disclaimer because it was not with our briefing materials.

Mr Moorman: As a private company, we have a little more leeway. We could actually not have a disclaimer because, by definition, we can say what we want as a private company. Our investors in the private company might have cause to argue with us, but that is a different issue. The forward-looking statement is the universal market wording for any projection. As you say, it is a function of

being responsible in how you project. We do not want to understate the potential of the project for investors or the communities in which it will operate. We must not overstate it. We really have to use, in many cases, our 20 to 40 years of individual experience. We are not perfect, but we will make our best guess at what those criteria will be and how they could unfold. There is a 5% chance that the combination of rate of production from the wells and the cost to develop the play just will not work; there is still that chance. Technically, I am extremely confident, but this is a new area in which the services do not yet exist, so there are risks on that front.

To answer your point, technically, the reserves are all at risk. We have tried to mitigate some of that. Investors, for example, want an independent opinion, so MHA Petroleum Consultants, which is a company from Denver that does a lot of work for companies in Australia and worldwide, reviewed the entire Ireland project for us. By definition, those people are auditors and should be conservative. They came back with 3·2 trillion cubic feet number versus our 4·4 trillion cubic feet. I am very happy with that.

Mr Agnew: I asked the question because there is always a perception about the gas and oil industry that there are overstatements about gas supplies. Drilling data from IHS, which is an energy research company, stated that shale plays are just giant Ponzi schemes and that the economics just do not work. There is that perception. There are always major discrepancies in the OPEC figures on the amount of oil and the assessments of peak oil. I accept the complexity of the industry and that there may be some explanation, but —

Mr Moorman: I like your point, Steven: there is definitely a perception around pricing. The difficulty in that regard is that, in June 2008, we had $14 gas in the United States. I could have thrown darts in the ground and made money at that. At $2 gas, you had better be good; that is what the price of gas is in the United States today owing to the success of the shale business in having roughly a 20% increase in its domestic volume at a time when everybody thought that it would go down for ever. The side effect is that its over-success reduced the price by which they are viable. My prior employer has a full cycle cost of $1·35 per gigajoule, as it is called. It makes money at $2. Very few companies in North America make money at $2 gas today, though. The economics are a function of time and price.

Mr Agnew: Despite the huge success, in your view, of shale gas exploration in America, Obama is still being hammered for there being no jobs. It does not seem to have had such a big impact on the economy that it has made headline news in that regard.

Water contamination is obviously one of the major concerns of communities, and it is certainly one of mine. As with the projections, I suppose that you cannot give a 100% guarantee that there will be no contamination of land or water.

Mr Moorman: No, I do not think that you can do that. As a responsible statement, you have to say that you will do everything that you can. The industry in the United States operates in a legal environment. That means that there is a cost to doing things wrong and a benefit to doing things cheaper. They try to find the balance. If they can do just enough so that they are coming out ahead, that is a corporate win. I do not believe that that would be accepted here.

Mr Agnew: In terms of assessing the risk, what would you say is the statistical probability of leakages within the lifetime of a well?

Mr Moorman: With our wells we aim for 0%. There is no question that we have to aim for that. We have to do what we can, and there will be steps that we can take to do that such as cement-bond logging to verify the cement. That can be done routinely to make sure that there is no chance of leakages. Continuous water monitoring is also in our practices. In other words, the moment that a problem is observed, the source well is shut in, cemented hard and is no longer able to do anything.

I would contrast that with what the operators in the United States did when they went into new areas. We learned a lot from that. Ireland has 13 wells that have been successfully drilled and cased and have not caused water contamination. That is a very good sign. I still think that a lot more research is owed to make sure that we have the right cement mix. A very fine cement is needed, so that it is durable and lasts forever. In the United States, as operators moved into new areas, again accepting their volume approach and the collateral damage philosophy, they came in with the same mindset that they had in other areas, and it was not uncommon for half of their initial wells to have problems. They may have solved that problem within a year, but that is not very much comfort in the first year.

Mr Agnew: You said that your target is to have 0% leakage from wells, and I am sure that every gas company has that target. However, the research that I have — I will make sure that I get the name of the study right — by Brufatto et al for Schlumberger Technology Corporation shows that, across the industry, 5% of wells leak in their first year and 50% leak over 15 years. If you take the 5% figure, that would mean that 288 wells would leak if we were to take your 1,440 figure. That seems a significant risk. I appreciate that your target is 0%, but I assume that you make statistical risk part of your business models. Can you give us an idea of your thinking —

The Chairperson: Can I just interrupt? There is a lot of electronic interference with the sound recording. I ask members of the public and colleagues around the table to check their electronic devices and to turn them off completely. Otherwise, there will be great distortion of the recording and the Hansard report will be inaccurate. Sorry for interrupting.

Mr Moorman: I cannot dispute the work of the service companies. They will have done what they have done with a lot of historical wells. I would have to say that that should be an embarrassing figure for the industry, but, in the United States, it evidently is not. We know that we cannot operate like that and cannot afford a single failure. If someone shows up with gas bubbles in their drinking-water well, that would probably end the project. That would be a terrible loss for the company and the country, because it would be an impact that would otherwise not have stopped a great project from going forward.

I think the important thing will be to set rules that respect the need for perfection in a result. We cannot guarantee that people are perfect, but we can check our work over and over to make sure that it is perfect.

Mr Agnew: Where there is contamination, will you compensate local businesses, farmers or communities that are affected? You were required to provide DETI with details of your commercial liability insurance. Will you give us a sense of what types of incident that liability insurance covers and whether it would cover leakages, etc? Given your commitment to transparency, will you publish those details?

Mr Moorman: Absolutely; that is all quite available. Right now, the insurance coverage is the minimum required, as, of course, we do not have field operations. As per DETI's requirements, when we begin field operations we will have to have a substantial level of liability coverage. Some companies reach a point at which they self-insure. Exxon Mobil does not pay somebody else premiums since it is responsible directly. From our point of view, though, any kind of subsidiary contamination, whether surface spills or underground contamination, would be argument for some kind of compensation. Insurance aside, you have to protect people. I am confident that DETI will review that insurance. I am not an expert on its situation, but I assume that that would be a matter of public record anyway. We would certainly make that available.

Mr Agnew: So, where there are spills, there will be compensation?

Mr Moorman: You have to. I come from the Canadian and North American experience in general. Nobody lets you off the hook if you cause damage.

Mr Agnew: Speaking of risk, it is very difficult to look at the background of Tamboran. You talk about the experience in Tamboran, but there is no experience of Tamboran, because it is a newly formed company. You talked a lot about bad practice in America. Southwestern Energy, which you were previously employed by, currently faces two lawsuits for alleged water contamination. What lessons have you learnt from the mistakes of Southwestern Energy?

Mr Moorman: Super, yes. Thankfully, I do not know very much about the details, but it would be inappropriate for me to comment directly on the lawsuits. What I can say is that one of them in Arkansas has to do with a substantial amount of gas that appeared in somebody's drinking water while next to a Southwestern Energy well. It had drilled 2,500 wells by then, and so, by American standards, it was, frankly, incredible that it was one in 2,500 wells. The lawsuit comes from the fact that someone was offered $1 million in compensation for that, and the well and everything was repaired and flow stopped, but they did not want to accept that. Their neighbours joined in a class action around that. That is the American system.

In Pennsylvania, where the second law suit is, Southwestern Energy has filed a counter-suit. The legal firm that came forward listed chemicals that showed up in the water well that are not in use in North America in oil and gas, so it is believed to be frivolous. Southwestern Energy is vigorously contesting that one.

As to your point about lessons, I am very comforted by the good operations practice that I saw there. I did not work in operations, of course; I advised on long-term issues such as the price of oil and the need to get gas out of the country because the prices were going to collapse. From that standpoint, I was not directly involved, but the operations people are among the best in the world in that business. There are a lot of best practices. The company reviews those with every single person in the operations team every six months. There is a document of about 1·5 inches that goes through every single one of about 200 steps that the company undertakes in every drill and completion to make sure that the staff know what the practices are and that they improve them all the time. Some operators do not take those precautions and do not train their people effectively. I have worked for some of them, and I have seen some of them. We are sure not going to be allowed to operate in that way in the rest of the world.

Mr Agnew: On the issue of gas in the water supply, there is a quote from you — please correct it if it is incorrect — that states:

"I'm understanding there are some parts of Ireland where people can light their water too."

I asked our Minister for Regional Development, who is responsible for water, and a colleague asked the Irish Environmental Protection Agency (EPA) whether they are aware of any instances of flammable water in the North or South of Ireland, and they said no. Do you have any evidence to counter that, which says that there are issues of gas in the water supply already? It is important that we understand the base that we are starting from. If we cannot do that currently, and then fracking happens and we have gas infiltration of our water, it is certainly a hint of a causal effect.

Mr Moorman: I will start and then turn it over to Tony. Our understanding, from talking to many water well drillers in the country, is that it is not uncommon to come across methane in people's water supply in small quantities in some areas and in larger quantities in other areas. We have talked to quite a few water well drillers, because the project will require quite a bit of water well testing, and each site will probably have between four and eight wells for testing purposes. That is a lot of wells.

They explained other things to us, such as the high iron concentrations in large parts of the country. Those are things that a responsible operator ought to know ahead of time, especially in the US, because there are places such as Burning Springs, where, as Lisa pointed out, 250 years ago you could light the water surface, which is how the town got its name. Alberta is rife with such things, and Colorado, in the 'Gasland' movie, is an area that for a hundred years has been known to light its water. These are well-established phenomena around the world.

In order for water to light, it has to be either full of methane — we are talking 90% — or you would have a water tank system, a burner system perhaps, that allowed you to accumulate methane. It would be possible to do that in Ireland with the water in some areas. I do not think that you would find anybody with enough methane in the system to light it instantly, but you can accumulate it so that you can get a burst, simply because of the top of a water tank being full of gas.

Dr Bazley: I do not have much to add to that, except to say that it is one of the main features of our environmental impact study when we start. We are aware that there are fairly high levels of methane in the water naturally; they test for it in the caves at Marble Arch, for instance. Much of it is biogenic methane — in other words, it comes from the peat. It gets into the wells, particularly, as Richard says, when they are left for a period, and it has been reported to me by drillers in County Leitrim, not County Fermanagh, that they have drilled only to come back a little bit later to find that somebody has lit a match and the top of the well is alight. That would not be unexpected in those areas. It is mostly biogenic methane in this case, and we can tell the difference between methane coming from the peat and any methane derived from deep down. That will be part of the detailed environmental impact study.

Mr Agnew: I am concerned, if you are saying that that is the case, that the Irish EPA does not seem to be aware of it, but I suppose that that is an issue for the Irish EPA.

Mrs Overend: Thank you very much for your presentation; it was very interesting. At the very beginning of your statement you talked about where you were in other parts of the world. You said that although Northern Ireland was the smallest place, it was hugely influential because of the location of markets. However, you also said that Northern Ireland does not have its own gas source. Are you targeting Northern Ireland markets, or are you using Northern Ireland as a base for something else?

Mr Moorman: There are two benefits to that. First, it is a tremendous opportunity; the shale here is almost 500 metres thick. Just to put that in perspective, it is about five times the average shale thickness in the United States. Very few projects in the world have that opportunity. We have a couple in western Canada. Unfortunately, with $2 gas nobody is rushing out to develop them right now. So the importance there is high.

The other thing is unquestionably that, with a 97% import, this is a product that is needed in the market locally. From that standpoint, you would rather supply something that has a demand and has an opportunity to grow than something that has to force its way into a market and try to justify its existence. Here we would be meeting a need, and the side effect would be that Ireland and Northern Ireland would have increased security, because something could go wrong on the other side of the pipelines: this winter there was a very cold spell in eastern Europe. I was in Italy at the time, and they were handing out fuel oil; they just did not have any gas. This is an opportunity.

The second thing, which is important to us, is that we view Ireland as a potential show home. This is a beautiful country. It would be a wonderful opportunity to take people to see a project in operation in the toughest environment in the world, where it is environmentally sensitive, where there are environmental impact assessments, where the EU's many directives come into play, and where it coexists well with, and creates opportunities in, the community. It is pointless for me to do that in central Australia. You also have a workforce that, bluntly, is better educated than in North America. I will not go into the stats, but not many Americans graduate. Therefore from that standpoint, we have a very educated workforce that, we believe, is also quite adaptable and mobile. If you are going to work around the world, I cannot see anything better than to have a team of people from Ireland learning the business and taking it everywhere else. I have ambitions to make this a model or a show home for that kind of project worldwide. As Stephen pointed out, if you have a lot of baggage in your company, why would you let that company into your country? We believe that there is much to be gained competitively by being at the top end of the curve.

Mrs Overend: Thank you. At the end of the cycle, in 2050 or whenever the gas runs out, what would the environmental impact be, and how would you return the land to its former glory?

Mr Moorman: The sites at that time, after the year of drilling, will be just slightly gravelled. The well is simply alternating steel and cement columns in the ground. Typically, when a well is abandoned and no longer needed, you dig down 6 to 12 feet, depending on the sensitivity of the area, and cut and then cement off the entire well bore so that it is full and cannot flow internally. Then you weld a steel cap onto it: "cut and capped" is a common oil and gas term. It is completely sealed, pressure-tested and then buried, so you will not see it. All the gravel will be recycled or taken to landfill or quarries, depending on who needs it and where.

The site equipment will primarily consist of compression. By then, much of it will not be as efficient, I am sure, as what we will be making then. Therefore, I expect that it will be scrapped; it will get pulled off the site, depending on the prior use of the site. If it is leased land, for example, it will be returned to the landowner in the condition that they want, as per the initial lease contract. If they want it returned in its original farmable condition, that is how it has to be returned; if it was treed or forested, that is how it would have to be returned. At the end of the day, the site must be brought back to its original condition, or agreed condition if it is a leased site. It is not an expensive process; for gas wells it is relatively cheap. With oil you have the potential for spills, etc. All our well pads will have an impermeable membrane underneath them, so nothing can get through anyway. That is pretty much standard practice now.

The important thing is that most jurisdictions — I think that Ireland has always had this — require the operator to set aside a very small percentage, as the case may be, of total revenues over the life of the project. Therefore, if it is producing a high yield, a lot more money goes into the escrow fund. That fund is set aside to cover eventual liabilities. In other words, the Government maintains control of that fund, and a percentage of the revenue has been set aside. On the implication of your point, the last thing that you want is for an operator to have no more production and a bunch of bills. Therefore, from that standpoint, it is an escrow account.

Mrs Overend: Do you hope to lease most of the land for those pads, or will they be purchased?

Mr Moorman: I do not have a preference. I do not pretend to understand all the rules, but my understanding is that there are cases where subsidies can be maintained for a landowner if they lease the land as opposed to sell it. There may be a benefit to the person in that case to lease it to us. In either case, we end up paying the same. If the project is successful, that land will be taken out of circulation for 30 to 50 years, so you have bought it, basically. You will just also have an annual payment on top of that. The important thing for us is to make sure that we have a substantial enough block of land that meets all the environmental impact assessments and stays away from people as far as possible to avoid creating any problems for them. If we own it, the complexity for us is that, suddenly, we are a large landowner in western Ireland. That does not turn over very fast, so we would end up continuing to own it. In all likelihood, it would be returned to the state. It depends on the situation. We do not know which lands are most appropriate until we do all our 3D seismic. We know where we can start, but, over time, we will try to pick the best places to drill as we become more familiar with the ground underneath. That means that we cannot even begin to guess today which person or company's land is viable for the project.

Mr Flanagan: I declare an interest: my family owns land in the area that will be affected in Fermanagh. Despite the fact that most of the discussion has focused on Fermanagh, this is an issue that could affect up to 12 counties in Ireland. It is not a localised issue. As someone who represents the people of the county, I am fully aware of the mood of the community in Fermanagh and across rural Ireland. Most people to whom I have spoken are passionately opposed to the proposals, and I find it hard not to agree with them.

I will be nice to start with. Richard referred to Tamboran's efforts to be transparent by engaging with the media, concerned citizens and stakeholders, and he has done that. In fact, Tamboran has been to the fore in selling fracking across Ireland. Other companies are involved, but they seem to take a back seat and let Tamboran take all the hit in public. I acknowledge that, and I commend you for it. That is the end of me being nice.

Tamboran was founded in 2009. Who owns it at the minute?

Mr Moorman: Tamboran is owned by a wide range of people mostly in Australia. Approximately 85% is held by five owners; our chairman owns approximately half of that. Three other owners and I have varying interests in the company. Last spring, we undertook what is called a seed offering, which is an initial financing round. It is like planting a seed, hence the term. I think that approximately 20 individuals, mostly in Australia, took positions from $50,000 to $1 million in the company and got about 9% of it. Since then, we have done subsequent raises; about 4% or 5% of the company was offered recently to more individuals. Most of them are in Australia simply because it is a network of people with whom our chairman is most familiar. They have confidence in him and his experience; he has done this kind of work in businesses for 40 years, especially in natural gas in the past decade.

Mr Flanagan: Is your chairman not a former investment banker?

Mr Moorman: Yes. In 1971 he started out as an investment associate at a small company in Australia. About 10 years after that, he got more senior roles, and he eventually became quite entrepreneurial. As we have seen in the past couple of decades, Asian growth has made Australia the centre of the universe for supplying product, such as hard minerals, oil and gas, to Asia. He was very fortunate to be in a very good place at a time when the work that he was doing was suddenly in high demand. He has done well through his business ventures.

Mr Flanagan: Your opening introduction to the Committee was that Tamboran is a world-class global unconventional oil and gas exploration and development company, with 12 full-time and 10 part-time employees. I have worked in small businesses that had a larger staff complement than that. Tamboran holds the rights and permits for more than 27 million acres of land across the world. Of those 27 million acres, how many holes has Tamboran drilled, and how much gas has it got out of the ground?

Mr Moorman: Tamboran, as you point out, is a brand new company. Our staff have all worked in the business for, to be fair, between 10 and 40 years. On our team, we can count some of the people who have been the most influential in the origins of this business. One such person is Daniel Jarvie,

who is the world's leading geochemist; he has opened up the understanding of what is in rock around the world. We take immense comfort from having selected such a team. The company is going through all its early exploration phases. Thanks to things such as environmental impact assessments, there is a natural calendar to everything that we do. It will probably be a year and a half or two years before Tamboran begins to drill anywhere in the world, and probably another year before there is any production.

Mr Flanagan: When you use the phrase "world-class", are you talking about the ability of Tamboran to go round the world and gather up licences to extract gas instead of its actual ability to do it safely?

Mr Moorman: No. The business model for Tamboran is in the early stage of, first, assessing the lands appropriate for development, getting the mineral rights, and then beginning the early stage of understanding how to crack the rocks. That is a very difficult project. Many companies, even the Exxon Mobils of the world, cannot do it; they just do not have the experience. I do not, but I am very fortunate: I have people on the team who can. From that standpoint, we very much have all the way from acquisition of land rights through the early development. We do not have on-staff today because it is not what we do today; staff are there to take the project through its thousand wells. That is a later set of skills. We have those people in mind; we know who they are, but they are not on-staff today because that is not where we are today.

Mr Flanagan: Is the phrase "world-class" is a bit premature?

Mr Moorman: It is a fair comment. We do not want to wait until we are a certain size to try to act like it. The largest companies in the world are subject to the greatest scrutiny; universally, they have much higher standards than small companies. This is as much an internal as an external statement. We operate at standards that are acceptable to the global community; if we did not, we would not deserve to be in that community.

Mr Flanagan: One of your earlier comments was that people often have no confidence in government or regulators. Although the confidence of citizens in government and regulators across the world is probably at an all-time low, confidence in the energy industry has never really been very high either. That is something that you need to take on board. This cannot be about the confidence in government or regulators; confidence in the energy industry just does not exist.

One of the most talked about issues since this became public has been the debate about whether Tamboran would use chemicals. Most experts whom I have heard say that that has not been done anywhere else in the world. Whether Tamboran decides to use chemicals is irrelevant; there are enough dangerous chemicals there already that you could upset. It does not really matter what you add to it. If you are going to do this, there are chemicals down there that you might upset, despite spokespeople on your behalf saying that radon does not exist in west Fermanagh or north Leitrim; it does. If it is disrupted, there will be serious consequences. I do not want to get into a debate about chemicals.

You stated that you will utilise rainwater and groundwater and that no water will be taken from public sources. Who do you think owns the rainwater and the groundwater? Eventually, it will become public water. If you take it as it falls out of the sky, it is public water. You have given figures of 0·31 million gallons of water a day. Over a 25-year period, that is 3 billion gallons of water that will be taken out of waterways such as Lough Melvin and Lough MacNean, which have very delicate ecological balances that need to be preserved. I have no idea how you can stand over your claim that you will not take water from public sources.

Mr Moorman: "Public sources" is a standard phrase that we use when referring to the industry in the United States and Canada. It typically means taking water from lakes, rivers, streams or public facilities, such as Cuadrilla has done in Blackpool: it has a line directly from the city into its site. That is standard practice; it is approved. Bringing in water from sources such as lakes and rivers means bringing in a lot of bacteria, which would represent a chemical challenge. Therefore, we are moving away from that.

I accept your definition that all the water that falls on Ireland is Irish water. However, I also accept the rights of landowners to the water that falls on their land, or that they extract from a groundwater well under their land, within the permissions that are granted to them by local councils.

Mr Flanagan: What size of a land mass would you need to be able to gather 0·31 million gallons of water per day in each well?

Mr Moorman: Again, you are referring to the peak year. At that point, I am guessing that we would have nine —

Mr Flanagan: I do not like the word "guessing", Richard. *[Laughter.]*

Mr Moorman: Sorry. I am pretty good at remembering numbers, but I am going back to the model in my head. That model is, of course, in DETI's hands. I think that we will do nine pads a year in our peak year, and that figure represents how much water would be extracted over the course of a year from nine well pads on either side of the border. That would be a peak year. It takes us about 15 years to get to that point and then it falls off after a few years

Mr Flanagan: Perhaps we will try to get that model from DETI. I would be keen to further analyse those figures.

Mr Moorman: I am happy to send it to you.

Mr Flanagan: Last week, we quizzed representatives from the GSNI on the figures in your press release of 1 February, which got considerable media attention, and rightly so. GSNI said that those were only guesstimates and that they were not prepared to stand over them. You released those figures. How can you stand over them? The GSNI gave you those figures, but it will not stand over them.

Mr Moorman: That is a very good way to try to summarise it. The GSNI is not in the business of auditing reserves, and it would not have been familiar with what is going on in the shale until we gave it our work. It does not have an independent source of information about the shale work. We invested heavily with Core Laboratories in the basin; it was approximately a $300,000 effort to get that information. The GSNI could have done that in the past if it had known or had wanted to do so. What came out of the information was the confidence of knowing the gas composition of those rocks; that is critical. The second thing that came out of it was what the structural composition of the rock was. Rock breaks down into sand, carbonates, clays and so on. Simplistically, if you have too much clay, a rock is too soft; you can crack it all day, but it will heal up all day. Those are the critical things to understand: first, whether you have a sufficient gas concentration; and, secondly, whether you can crack it intelligently. The GSNI would not have had access to any of that information.

We finished that work in December. Our annual report was submitted by Tony, and we presented it to DETI on 12 January and the day before to the Petroleum Affairs Division (PAD) in Ireland. Both groups received practically identical information, but with slight differences, according to what is done in each jurisdiction. We knew that, sooner or later, that information would go on public record, as it had been submitted. Therefore, we decided that we had better put it into context for people; otherwise people would ask questions about pieces of it without understanding what it means.

As a transparent operator, it is very important to me that we are up front with people about the scale of the project, and although that can be a good thing, it is also a scary thing for some people. Therefore, we have to be clear about it. If we are not, you can appreciate how DETI would suddenly receive a bunch of well applications. It would not be staffed for that, and would not know where it was going because no one had done a study on the cumulative efforts that the project would mean to the community. That was well raised earlier. We do not want to surprise anybody. Transparency means that you tell both sides of the story upfront.

We then interpreted it with our experience. We have been through many projects that were just rock at the beginning and that became production later. That is where our guesstimates and the range of results have to come from. The project could be as much as three times bigger — that is clearly delineated in our work with DETI — than what we based our published results on. We cannot make promises beyond that because we are getting shallower at that point; we are getting into a 500 metre depth and there are uncertainties. At 300 metres, the Fayetteville shale is perfectly safe, and, aside from one incident that was due to bad casing, it has never had a water contamination issue. I cannot guarantee that for Ireland until I drill a bunch of wells and we study seismically where the cracking goes to establish whether it moves up or there was ever any risk. If we start at 1,000 metres and see the fracks climb 500 metres, we would not want to drill too much closer than that.

That is the kind of work that must be done. This project will need, for want of a better word, a tight leash. You have to study the data all the way along, and that is, of course, what we do in the beginning. We study the data; we understand it; we put it out there so that everybody can see it. DETI would not be in a position to evaluate that. To comfort it and our potential investors — although most of them do not need it — we brought in a third-party evaluation firm to make sure that we had an independent assessment. That is exactly the problem with a company doing its own work. That is unacceptable to the investment community in the long run anyway. Why should it just take our word? Independent assessment is really the way —

Mr Flanagan: Of course, you paid the third party.

Mr Moorman: Yes; I know that that sounds funny. How can you have anybody assess you if they are somehow getting paid or even know your business? How do you have a truly independent assessment? Are they not all biased in some respect because they worked in the industry?

Mr Flanagan: Are there any connections between Tamboran and that other company, apart from the fact that you commissioned its work?

Mr Moorman: No. Our chairman met its representatives at a conference a couple of years back and they had a really good client list. In our business, it is important that we have auditors who are recognised by many companies around the world. Otherwise, they have no credibility.

Mr Flanagan: Security of supply and the delivery of 50 years of energy security for the island of Ireland was one of the big points that you laboured in your press release of 1 February. However, I spotted a contradiction in what you said today, because one of your other arguments is that taking shale gas out of Fermanagh and Leitrim will drive down the price of natural gas in Ireland. Are you giving us a guarantee that any gas that is taken out of Ireland will be sold, distributed and used in Ireland, or will it be exported to the European market and sold to the highest bidder?

Mr Moorman: To be very clear: it cannot be exported without reversing the direction of flow of the pipelines that bring gas in right now. Moreover, from an economic perspective —

Mr Flanagan: There are no pipelines where you are taking this out, so there is no reversing anything.

Mr Moorman: No; fair enough. We are talking about exporting off-island, if you want, back through the interconnector. However, you are absolutely right: we or somebody would have to build a line. The most likely scenario is that someone would build it at our cost. I mapped out what we would have to do to export, because some people had that concern. For that to happen, we would have to build a pipeline all the way from Fermanagh to that interconnector. That would be a massively expensive undertaking. Based on our modelling, we could not supply the entire island for more than five years — despite our best effort — and that is out to 2025 or so. It would never justify the investment of hundreds of millions of dollars in such a pipeline. That is even if you could, because many people would say, "We have a perfectly good pipe here already". From that standpoint, you have to expect that it goes to the market.

If that was a real concern, the Committee, or someone, could say that we will not export gas; that is just not allowed.

Mr Flanagan: It is not a concern that I have, to be honest. You distanced yourself from the alleged environmental disasters in Southwestern by saying that your role there was more of an analyst or adviser. You said that you concluded that you needed to get the gas out of America because prices were going to collapse. So, if Tamboran takes natural gas or shale gas out of Fermanagh and Leitrim, or anywhere else, and the price of gas plummets, what is to stop you doing the same thing here?

Mr Moorman: Fair question. First of all, when we talk about plummeting in the United States, we talk about free gas. We talk about more gas than anybody needs. I will belabour that point and say that the United States has had a unique experience. It had so much success in its shale gas projects that, for the first time in decades, it reversed its decline and actually grew substantially, by 15 billion cubic feet a day. The amount of new gas that was added in the United States in the last three years alone was 30 times what Ireland burns. That shale project result was incredible. My job, and that of my team, was to study every project in North America so that we could really see where the volumes were

going. There is no doubt in our minds that the volumes were going up faster than the market could absorb them.

The United States has always been an importer. It has very little mindset toward anything but consumption, so we were unsuccessful, after three years of trying, to even get our management team open to the idea of export. The rest of the world, like Canada, happily exports volumes. We are talking about a price collapse, and part of what drove the price collapse, and where things are a little misleading, in my humble opinion — I apologise if this is a little deeper than anyone wants to hear, but I will be quick on it — was foreign investment in the United States energy sector, from companies like Exxon Mobil and Statoil. They came in and literally poured tens of billions in. Roughly $80 billion was poured into the United States industry by outsiders over the last five years. That is the equivalent of putting a runner on steroids. The industry raced ahead much faster than it naturally should have been able to because of outside investment trying to learn shale and getting pressure from its investors to do so, so that they could go international with that knowledge. The side effect is that the United States overwhelmed itself. Now it has plenty of gas for a long period of time. Shiner is a company that is actively trying to export gas. It has approvals, but I do not know if it will actually be allowed to do it, because the United States just does not have that mindset.

In Ireland, with such a gross import level, at 97%, there is just about no chance that the project can ever supply enough gas to actually reverse that entirely. We think that we will reduce price inflation, but, as we told the Utility Regulator a couple of months ago — he actually had the insight before we got to say it — we all expect the price of natural gas to rise in Europe, because the price of oil will rise, and gas prompt indexes the price of gas to the price of oil. That is not going to change.

Mr Flanagan: In response to that, economically I would say that we are doing the wrong thing by focusing on natural gas, but, of course, you are from the industry, and that is what your interest is. However, from a governmental point of view, I think that we are focusing on the wrong aspect.

Mr Moorman: If I may add a thought on that, because I think it is important, right now, gas is just 15%, as indicated by the Chair earlier. It is a small part of the mix today. It has room to grow, in the sense that some businesses are actually still using heavy oil for power. That is incredibly wasteful on many levels. That said, it is always going to be just a piece of the energy mix. As you point out, a lot of other energy sources are needed. Nobody should be naive. I think you are right to point out that other sources are going to be needed in the long run and in the near-term too. Getting Ireland much less dependent on oil would be a huge step. It is the largest per capita burner in the EU. Those are things that need to be addressed from a sustainability point of view. From our industry's point of view, we are meeting the need that exists today, and that is really why we bring the product forward. If there was a cheaper, better version, we are confident that it would be there, but I recommend that every country should think long and hard about where it needs to be in 20 or 30 years, because hydrocarbons will not last forever.

Mr Flanagan: I agree with you, Richard; I think that we should think long and hard about this and not rush into any decision that we cannot reverse. It is still an emerging technology. The long-term environmental and social impacts of it have not been determined and I think saying that you are going to have a planning application in in 12 to 15 months is far too soon.

My final question is for you, Mr Bazley, and it is about your role on the Council for Nature Conservation and the Countryside (CNCC). We are all aware that Minister Attwood recently reappointed you to that, and nobody is questioning your qualifications or capability to sit on that board. You have a long history and a noteworthy background as an environmentalist. However, do you not see some sort of conflict of interest in somebody from one particular aspect of the energy industry being able to influence decisions taken about the wider industry by a group that was set up to advise the Environment Minister on policy, and potentially planning policy?

Dr Bazley: No, I do not see a conflict.

Mr Flanagan: Right. 'The Irish News' today reports that, in September 2011, you made a presentation on shale gas to the council but the minutes of that meeting had no record of a declaration of interest. You have come out and said that that is not a matter for you but for whoever takes the minutes and the notes, which is all well and good. However, did you make that presentation as a representative of the council or as a representative of Tamboran?

Dr Bazley: I made it as a representative of the council. At the time, I was not working for Tamboran full-time but part-time. I was just going into full-time operation with Tamboran. I was asked to give the facts. I have made it quite clear that I was not trying to persuade it to accept this policy. Indeed, I would be excluded from doing that. I was just giving an outline of the facts. Much as you have heard today, I was not attempting to force the case through in any way. Indeed, as you know now, the CNCC has — and it had then — a rule that you must state at the start of every meeting if you have an interest. That was always stated, and it was quite clear.

It is much more formal these days, and I am working for the company full-time. Therefore, I will not be involved with any other discussions on shale gas in that council. However, I am involved with a lot of other aspects of the environment in which I have experience, and I think that I can help to look after the environment in Northern Ireland. When I set out on this task, I had all the same concerns that you have brought up today. However, I have educated myself on the facts as I have gone along and become satisfied. I love this country too, and I feel that, being in the company, I can make sure that the environment is not badly affected.

Mr Flanagan: Tony, I do not see a difference between you being employed by Tamboran full-time or part-time. I do not really see that as a get-out clause, but I appreciate what you are saying. When did you start working for Tamboran?

Dr Bazley: In the early days I was involved in helping out with the licensing process before the licence was even applied for. That was largely because a colleague of mine, who is now one of the directors of the company, had been an executive director of the British Geological Survey. I had worked for him for a short period when I was directing the Geological Survey of Northern Ireland. He came across and was doing some work here. I acted literally as his office boy at the beginning, and then we developed this through the licensing stage.

Mr Flanagan: I have made clear my concerns about the relationship that you have, being on the board of the Council for Nature Conservation and Countryside. The fears that I have about the relationship between GSNI and Tamboran are completely off the Richter scale compared to that. I see GSNI, which is supposed to be part of a Government Department, out selling the message that Tamboran will do this and do it right. That was very much the message that I got at a very heated public meeting in Enniskillen at the start of September.

Tony, you have said that you will not be partaking in any discussions on the council about fracking. However, the fact of the matter is that the renewable industry is in direct competition with the natural gas industry. Can we be assured that you will not partake in any discussions about any forms of renewable energy that might be competing with the natural gas industry?

Dr Bazley: I will be discussing with the chairman of the council how we go ahead with this. I am very aware that gas can only be a transitional fuel. It is a finite source of fuel, and it is transitional. It is very important for the renewables industry that there is something to look after the intermittent supply that we get currently. Like you, I would love that to be 100% of our supply, and we are working towards that. I am satisfied that the natural gas can be obtained safely without damaging the environment. If that can happen, it has a place within the next 20 or 30 years.

The Chairperson: Last, but not least, is Mr McGlone.

Mr McGlone: I will try to be as sharp and clear as I can. It is important that we are as best informed —

The Chairperson: I stress to colleagues that I have given plenty of time to people. I will certainly not limit your time.

Mr McGlone: I appreciate that, Chair.

The Chairperson: This is a very important issue.

Mr McGlone: There are a number of issues that I want to clarify in my mind. Some are further into the business area, but, inevitably, issues come from a very informed point of view in the stuff that I have read. Climate change and the use of gas is, obviously, a major issue for us. There are two or three

things, one of which is the control of the process. Concerns have been expressed about fugitive methane emissions. If that is not managed, it could be up to 30% as part of your process.

I want to move on a little bit to the use of gas. There is an increase in the atmospheric concentration of carbon dioxide. Using gas can make it more difficult to reduce carbon emissions and to grapple with climate change, which has probably been witnessed on our streets through the flash flooding in the past 24 hours. That is a big issue for a lot of people, and many Governments are trying to grapple with it. What I hear about the use of gas is that it could have a retardant effect on reducing carbon emissions and the problems that we are having in our atmosphere. What are your views on that?

Mr Moorman: I appreciate the comments. I agree with you: in the rest of the world, especially, climate change is very high on the agenda for Governments and citizens. The challenge for the oil and gas industry is that there is a limited amount of research when it comes right down to the issue of methane and natural gas operations. The primary source for what has been put out there so far is the Cornell University study by Howarth and Ingraffea. It did not fare that well in peer reviews; it was pointed out that they used a 20-year horizon, which conflicts with the established 100-year horizon. On the surface, that does not sound so bad, but that sort of preferential time period guaranteed that methane would look worse than what happens over a 100-year period, so it distorted things. Industry took a lot of exception to his use of fugitive emissions. For example, in the compressors that we mentioned earlier, which power the production of gas from low pressure to high pressure, gas is burned in service of the project; it is part of the fuel. It is just like the engine in a car; fuel is burned. He counted that as a fugitive emission instead of a burned part of the process, which made it look like emissions were much higher. We get a lot of this from something that a lot of people ignore: the second Cornell study. Everybody quotes from the first one, but the second study bashed the first one and said that there were so many flaws in it. His own research was quoted to point out where he felt that he had incomplete data, and so on.

From a research point of view, I accept that not enough is being done. The problem is that you cannot trust industry to do it. It will fund some study, but, whatever it says, nobody will trust it. Industry will not trust so-called think tanks that do their own research because a lot of them have connections. Ingraffea is funded by the Gasland producers directly; he makes no secret of that. Many associations in New York happily fund anti-hydrocarbon causes. That is their entitlement; oil and gas funds their own. From that standpoint, it is very difficult to get a fair debate in the process. As a company, we do not step into that.

Mr McGlone: Do you or do you not accept that there are emissions? That is essentially what we are talking about here: not what he says or what she says. Do you accept that there could potentially be an issue around emissions?

Mr Moorman: There are definitely emissions.

Mr McGlone: I am asking how you will control those; that is the issue.

Mr Moorman: Learning from past experience is really important here. The first thing that has evolved slowly in the United States but is now being done is what they call green completions, which is a funny term, but essentially what happens is that, when a well is first brought on — when it is perforated, fracked and flows its gas — traditionally, water will come back with that gas and that will interfere with the flow rates. What happens is that they will bring that all back to surface, put the water in the tanks through a separation facility and then the gas will be burned or vented. That is an awful lot of value and emissions going up in the air, and that happens because there is no infrastructure nearby for the gas to be directly piped in.

The premise of green completions, which is now in use by many companies in the United States for commercial reasons, is that they bring the pipeline to the edge of the well before they open it up. That way, the gas is released. It sounds so simple and obvious, but there is a commercial reason for everything. If water is interfering with your flow rate, you do not have the best flow rate, so you get the water out of there so you can announce a cleaner, better flow rate. That is why that process was happening. That would be unavoidable in our initial exploration wells, if approved.

Mr McGlone: In most of these things, you follow the money. You are probably aware of the Scottish Widows investment partnership, which is investing along with BP and Royal Dutch Shell and the likes of those. It issued a warning to say that the industry should take "rapid action" to eliminate emissions of climate-warming methane in gas production. I am looking at what the money is saying here. We

are here to hopefully defend and articulate the rights and the wrongs, but whenever you get significant and very substantial investors going in that direction, I would reckon a lot of your investors would be looking at that and saying that we need to get this right.

Mr Moorman: I think you are right to think that what are called activist investors, funnily enough, raise the issues that people think, care and talk about. Those issues are finally being raised by companies in those venues, and some of them are big enough, finally, that they can make their voices heard in a way that the company has to listen. It is a whole lot of little things. Emissions prevention has to be a mindset. For example, all of our tanks are closed. They use what is called a vapour recovery system. That takes the water that comes out of the ground with the gas, which will naturally have a little gas bubbling in it like a sparkling water would. Even at 2 psi or 3 psi, that gas is going to show up in a tank. In the United States, you would flip the hatch and let that vent out, especially in places such as North Dakota where there is not that much gas and no infrastructure. That has been a standard practice and, as you pointed out, that is the kind of thing that a company has to recognise is a problem.

The good news for very commercial, follow-the-money reasons is that that is money going up in the air too. People may not care quite as much when there is $2 gas, but Europe pays $10 to $15, which is six times what the US pays for gas right now, so, from that standpoint, we are doing everything we can to conserve gas. I think the main sources that an industry has to watch for in emissions are, first, the initial flows, because the wells are at very high volumes. We cannot avoid that in an exploration phase, in the first five wells, because there is no pipeline in an area, but a commercial phase should not start without infrastructure there. That would erase a substantial amount of the emissions, which were raised by Dr Howarth and Dr Ingraffea, which I think is very important to discuss.

The little details are things like making sure the tanks are self-contained and vapours are pulled off, as well as making sure that you have pressure controls on everything you are doing so that the bubbles of gas do not leak out at every opportunity. That is about welding practices. It is all the little things that matter, and I think those things are completely enforceable and quite measurable. It is pretty easy to tell if your site is emitting. Again, it is not my place to set the rules, but we are open to any rules that would solve those problems.

Mr McGlone: Thanks for that. I want to extend the investment or following-the-money argument. I have read the conclusions of the Tyndall Centre report, which was complied on behalf of the Co-operative Group, with whom I know our Minister became involved slightly. One of the points that was made in that report was that, for the same substantial investment that is required for shale gas wells and power plants to produce gas sufficient for 78 gigawatts of electricity generation, you could deliver 21 gigawatts of onshore wind capacity or 12 gigawatts of offshore wind capacity. That takes us back to the climate change and investment arguments. If you were look at those two arguments, which of the two options, commercially, seems the best to go for? From an environmental and climate change point of view, wind generation certainly ticks all the boxes. I am perhaps asking you to speak against your own project, but that is a very strong and attractive argument that is made in some of the stuff that I have read.

Mr Moorman: I agree that, on the surface, there are elements of that. On a commercial front, the problem we run into is that every jurisdiction has different ways of dealing with these things. Some jurisdictions heavily subsidise wind power, while others, like the United States, do not. That distorts the commercial challenges. From our point of view, and not to talk against the wind industry, nothing is without cost. You can build windmills and create a very good source of energy in certain parts of the world. However, that requires a tremendous amount of steel and movement. The world is already pushed very hard on its manufacturing capacity, and all the projects we are building worldwide are exacerbating the cost of all kind of things. From that standpoint, it is not free. Windmills also need maintenance. In Alberta, they kill thousands of bats and birds each year, and those are the costs because of where we put windmills. We put them in the fairways that wildlife and especially birds want to use. Therefore, we endanger things. Oil and gas also have their obvious problems.

I do not want to belabour the point, but we do not get set out too far on that. I share people's concerns that not enough research is being done on things that are really important to our long-term sustainability. At the same time, for economic reasons, the world burns a lot of natural gas, and, as oil supplies fade sharply in our lifetime, I fully expect that we will have to burn a lot of natural gas until something else is there. Some friends of mine are working very hard on bioengineered oils, and I hope that they are fortunate. Nothing else replaces energy's burn intensity apart from nuclear power.

Nothing else puts that kind of power in a small space, and, as a world, we need something that does that. Good luck to those guys, but they are probably decades away, if it works at all.

As Tony said earlier, the world has transition issues, and I am not the person to give you the answers to those issues. I can only tell you that we see a major product need here and risks resulting from limited access. On a climate level, 15% of the gas is burned before it hits the shores of Ireland, and that causes lots of emissions. We can solve that problem right away with a domestic supply. It is not an easy trade-off and there will always be opinions in the mix. From our point of view, I think that it is really important that we focus on following the standards set out by the Government and the regulatory authorities. We must reduce the price of natural gas in Ireland and the Utility Regulator was very plain on that. Why would you pay more? He will not accept that, and that takes it back to his mandate. That is really where we have to stay focused.

On the Chair's point, we have a continuing and intensive obligation to communicate. Really, you cannot do enough of that. When people ask you for something, you have to talk with them. The challenge there is that we are all learning as we go; we are trying to make it better all the time and address people's concerns. As was mentioned, your regulators have a job to do. As I understand it, you steer them. We invite greater regulation, a fact that we have made plain to a million European civil servants in our various publications. The business ought to be more heavily regulated, because public confidence is the only way that this kind of energy supply has a future. Our blunt opinion is that, in Ireland, it is a windfall for the Government, which they can choose whether or not to access, on the basis of many reasons. Shale gas has a finite use; that is all there is to it. It is an effective transition, but, as was pointed out, there are a lot of issues, including climate change, that have to be resolved in that transition.

Mr McGlone: Finally, to come back to Fermanagh, you said that you did not see fracking harming tourism. Without getting into the merits or demerits of land use and public liability issues, a colleague of mine recently made an announcement on the concept of a national park in Fermanagh. Whatever about the extent of a national park there, its attractions, which have yet to be proved to me, would include increasing tourism. I do not see that resting comfortably with fracking or any other exercise going on in lands within or adjacent to that national park. I do not know whether you are aware of that situation, but —

Mr Moorman: A little bit. I guess that my thought is that we have extensive national parks all over Canada. Rules have been set. Pace is usually the biggest issue. As you pointed out, if you are going to do something in a given area, say in a park, it has to be minimised in that area. However, again, I will be very clear: that is what a company would tell you, because we have confidence in what we do. We have experience of operating in those environments in North America. I have, for example, operated in northern Alberta, where we had to use what are called caissons, which are just big, steel-rimmed enclosures That were 10 to 20 foot high and went for 100 feet around the well head. So, no matter what happened in there, it was not getting out, because we have some very sensitive places in northern Alberta, which is a world heritage site. Therefore, it can be done, but that, to put it bluntly, is the people's choice and the regulator's choice. My point of view is that there is a resource underneath there and if a park is formed, it can still be developed. However, you have to respect what people want, and your point raises issues; some people may not want to associate a national park with fracking. That is the hard choice to be made about where we get our energy.

The Chairperson: Mr McGlone asked about carbon emissions. There is obviously a higher carbon emission from oil than from conventional natural gas. Is there an emission difference between conventional natural gas and unconventional shale gas?

Mr Moorman: Not in the composition of the gas, although, shale gases — unconventional gases — are traditionally usually cleaner due to the nature of the rock. It is so tight that bigger particles, such as what are called BTEXes — benzenes and toluenes — if they even exist, cannot move in that kind of rock. The shale gas in Ireland and Northern Ireland is very dry. Compositional work makes clear that there will be no liquids such as BTEXes etc associated with it. There is no fundamental difference there. The difference, as I describe it to people who are new to the industry — for example, in the investment community — is the intensity. Where you had one well per square mile, you could now have between eight and many, depending on the nature of the rock underneath. In Ireland, we see the potential to have between eight and 24 wells in the project area. That will inevitably mean lots more jobs, lots more operational activity and all the good things. However, on the flip side, there will be more trucks, more activity and more water. Those are the trade-offs, and that is the difference operationally.

Shale gas is a much more challenging business logistically. Half of our effort goes into making sure that we do it as efficiently as possible and in minimising all the efforts we have to make with trucking. Who wants to pay for more trucks? Logistics are hugely important, and you can lose your whole budget if you are not efficient.

The Chairperson: I thank you, Mr Moorman, and your colleagues very much. It has been a long session, but I think that it has been very worthwhile. Thank you for your answers. If you have any additional material or literature, we would be very pleased to accept it.