Environmental Audit Committee

Oral evidence: Arctic follow-up, HC 533

Wednesday 17 December 2014 (PM)

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Written evidence from witnesses:

- Shell International Ltd

Watch the meeting

Members present: Joan Walley (Chair), Martin Caton, Zac Goldsmith, Mark Lazarowicz, Caroline Lucas, Dr Matthew Offord, Mrs Caroline Spelman, Dr Alan Whitehead, Simon Wright

Questions 57–130

Witnesses: **Edwin Verdonk**, Vice President Exploration, Europe, Russia and CIS, Shell International Ltd, and **Peter Velez**, Oil Spill Response Consultant gave evidence.

Q57 Chair: I welcome you both to our session this afternoon. It might be helpful if I recap slightly, to put the session in perspective. I am sure you are aware that we have had two reports on the Arctic, and we are intent on following them up. It is fair to say that we have had concerns about safety procedures for operations in the Arctic; indeed, we had evidence about that this morning from two panels. Integral to the evidence we have heard was evidence about the Kulluk incident.

I want to make it plain at the outset that we are respecting the agreement that has been reached, and the fact that we cannot talk in detail about the Kulluk because of current issues in the US. None the less, we are grateful to Shell for coming along this afternoon to talk about preparedness and safety risks generally, and about the wider aspects of exploration in the Artic. Following the two sessions we had this morning, the question is: how far ahead of the science is Shell on the structures that are in place, in terms of protection and readiness to deal with issues? That is the context, which I would like to point out at the beginning.

As you can see, nearly all the Committee's members are here today; they all want to come in with questions, and they will all try to catch my eye, but I want to start with a general question. We are all aware of, and concerned about, the fall in oil prices, and it might be helpful at the start to have some indication from Shell of what its implications might be and how it affects your business planning.

Edwin Verdonk: Thank you, Chair. The oil price, of course, is lower than it was, but it is important to realise that, in our business, we take investment decisions in the long term; we

base our investment decisions on long-term oil price prediction. At the moment, what needs to be played out is whether this low oil price is something which will be for the long term or not. If it were to be a significant change, then we are very used to these changes, in our long time operating in the hydrocarbon industry, and we will adapt accordingly.

Chair: Thank you very much for that.

Q58 Dr Offord: Back in October last year, the Government produced "Adapting To Change: UK policy towards the Arctic". Can you confirm that you were consulted on the construction of that document?

Edwin Verdonk: Yes, we certainly have been contributing to small focus groups and, as such, have been consulted on the document.

Q59 Dr Offord: What is your view of that document? What do you think is good about it? Equally, what do you think is bad?

Edwin Verdonk: In general, we are quite supportive of the document—the 2013 White Paper—for two reasons. One reason is that the science is mentioned a lot. Science is the right basis on which to responsibly operate in the Arctic. The other part in the document that we find very important is the sovereign right of the Arctic nations to invite the industry to, in a responsible and sustainable way, operate for hydrocarbons there.

Q60 Dr Offord: Are there any areas on which you would like to see greater emphasis in the document? Are there any additional issues you would like to see in it?

Edwin Verdonk: At the moment, it forms the right basis to continue our discussions with the UK Government and to see whether we can further improve our common understanding of what is required in the Arctic. As I said, ultimately, we all want to do responsible and sustainable things there.

Q61 Dr Offord: To press you further, though, what areas would you like to see further improved?

Edwin Verdonk: As I said, at the moment, we are happy with where we currently are on the statements of the UK Government, but if there are concerns, we are happy to be in a constructive dialogue with the Government to see where we can get better awareness or whether there are, indeed, areas that need improvement.

Q62 Simon Wright: Can you tell us your current plans for oil exploration or drilling in the Arctic?

Edwin Verdonk: The first thing to say is that the Arctic has had a long history of commercial activity. Sometimes, maybe, it feels a bit as if we are just deciding now to do something there, but Shell has already been in Alaska for almost 100 years, and drilling offshore in the Arctic has taken place regularly since the '80s. In that respect, this is more a continuation of activities, rather than a completely new start. Where we are currently planning activities, we are preparing ourselves for an option to drill in 2015 in Alaska. We have some exploratory surveys ongoing in Greenland. We are active in the Barents sea in Norway. That is where we are

Q63 Zac Goldsmith: On your collaboration with Gazprom, at the moment the plans are onshore; are you working on any offshore plans? Are any of the sites that you just described places where you would want to collaborate further with Gazprom? The company keeps coming up in the concerns expressed by environmental groups and some of the neighbouring countries.

Edwin Verdonk: Gazprom is one of our key strategic partners in Russia. We have, for quite a long time, had operations with them onshore and offshore. In offshore, we have just celebrated our 20th year of production on the Sakhalin project, which is offshore in the Russian sub-Arctic. Two years ago, we signed a memorandum of understanding with them to explore for further opportunities in the Arctic, and that is where we are.

Chair: Sorry, a memorandum of understanding to do what?

Edwin Verdonk: A memorandum of understanding to explore for further opportunities in the Arctic.

Q64 Zac Goldsmith: May I follow up on that? According to most analyses, Gazprom is the company that raises the most alarms in terms of practice. I would not say that Shell observes the highest standards, but there is a gap between the two. The question is: who will be setting the standards in any collaboration between Shell and Gazprom? Is it the case that in any joint project, the Gazprom standards would be elevated to the standards set by Shell, or would they be depressed to the standards of Gazprom?

Edwin Verdonk: I would disagree with the description of the gap. In Russia, the Russian operators have been active for a very long time in the Arctic, both onshore and offshore. They have developed a sustainable way of exploring and developing oil and gas. If I go back to the Sakhalin project that I just mentioned, there has been a healthy and constructive co-operation between Shell and Gazprom in a difficult offshore project that has seasonal ice. With Gazprom, we were able to acknowledge fully the environmental challenges and make decisions around that.

Q65 Zac Goldsmith: I do not doubt that. For the observer with concerns and who wants to know how Shell is likely to be operating in the region, is it fair to say that one need only look at the practices employed by Gazprom to take a view on how Shell will behave? In other words, are you satisfied that Gazprom operates at the highest necessary standard? Is that Shell's view?

Edwin Verdonk: In the Arctic, we think that it is important, given its remoteness and the environmental challenges, to share as much as possible globally on the best standards we can come up with. That is important. There is a real opportunity—through such groups as the Arctic Council and other groups, both locally and globally, that are looking at the Arctic—to work on agreed standards for the Arctic, so that we can operate there responsibly and sustainably.

Q66 Caroline Lucas: I just wanted to push a little on the relationship with Gazprom, because a lot of people find it quite strange. We know, for example, that Gazprom's equipment for the Arctic is judged as being decades out of date. In 2011, one of its rigs sank while being towed in the Okhotsk sea, killing 53 of the crew. Amazingly, Gazprom's reporting on injuries and

fatalities in its 2010-11 sustainability report did not mention that at all. I have a whole list of things, such as ladders being torn off in storms. The way that Gazprom is trying to undertake its plans ought to be illegal under Russian law. If you add to that the fact that Shell's subcontractor, which I think is called Noble Drilling, was found guilty of eight felonies just three days ago, it suggests that you should surely be more careful about the company you are keeping. It is a pretty damning record of failures.

Chair: After Mr Verdonk, I will bring in Mr Velez.

Edwin Verdonk: On the Noble incident, we clearly regret that. My colleague Peter Velez can say a couple of more things about the events with Noble in 2012. We regret them, because those events were clearly not aligned with our business principles. However, at the same time, we are convinced and we worked together intensively with Noble to clearly improve immediately and make sure that these events would never occur again. Peter, do you want to comment?

Peter Velez: Let me go back first to the Gazprom issue. I will use Sakhalin as an example—I am very familiar with Sakhalin, having been there multiple times and worked with Gazprom and our people there. I think your question, Mr Goldsmith, was on how the project was designed. We were heavily involved in the design of the facilities, the drilling of the wells, the pipeline, and the onshore and offshore facilities. At no point did Gazprom push back on any of our requirements. As a matter of fact, they even agreed with everything that we were proposing, so those facilities have been built not only to Russian standards, but to Shell standards.

Q67 Zac Goldsmith: For the observer on the outside and given what Caroline Lucas has just said, that suggests to me that Shell is not wanting to raise the bar very high. Therefore, for those people who have concerns about what could, and some people say will, happen as a result of drilling in the Arctic, this is not very reassuring.

Peter Velez: Well, I feel like we have taken all the steps and our standards are very strong. We take every step to prevent any incident from occurring, and we also have very strict Shell standards. Wherever we operate or have a partnership like we have with Gazprom, as Shell, we follow those Shell standards. Essentially, we don't have an option not to do that, and our partners that we work with understand that that is the case.

If I go to Ms Lucas's statement on Noble, just like Edwin said, we are disappointed by what happened on that rig and the steps, but I can also say, being familiar with the operation there, that Noble is a large drilling contractor, and they have many rigs and very good programmes. These incidents were immediately addressed by Noble. Shell was involved in following up to make sure that they followed up on all those incidents immediately as soon as they found out. We take them seriously. They took them seriously, and we are committed to making sure that they continue to operate and maintain their rigs in a manner—they are responsible for operating and maintaining their rigs, but Shell is also going to take additional steps of following up and making sure that Noble is operating and maintaining those rigs, not only to the standards that they have, but to the standards that we fully expect.

Q68 Caroline Lucas: I would simply say that to have one of these examples might be unfortunate, but to have as many as there seem to be looks like carelessness, so in that

respect, did you anticipate the Ninth Circuit Court of Appeal's ruling, which upheld a challenge to your supplemental environmental assessment?

Peter Velez: Any legal challenge we cannot anticipate, because as I think you probably know, in the US, any party can essentially file a legal challenge. We take those challenges seriously. We follow up on them. The challenge was really not to Shell. It was to the Bureau of Ocean Energy Management, which is part of the Department of the Interior, so it is their responsibility to follow up on it. It wasn't really against Shell. But right now, that supplemental environmental impact statement was issued, I think on 15 November 2014. The comments are due on 22 December, which is in about five days. At that point, comments will be submitted and the Department of the Interior and the Bureau of Ocean Energy Management will review the comments and then issue their second supplemental environmental impact statement. We will comply with whatever they come out with in that environmental impact statement, since it is part of the regulatory requirements in the US for Alaska operations—and anywhere in the US.

Q69 Caroline Lucas: But it does show yet another challenge to oil spill response plans. The court talked about the figures in the oil spill plan being "arbitrary and capricious". It does not instil much confidence.

Peter Velez: Well, that is the role of the Bureau of Ocean Energy Management.

Q70 Caroline Lucas: But they are the figures that you are basing it on, aren't they?

Peter Velez: No, it is their data. They are the ones that maintain their data, and they are responsible for preparing their environmental impact statement. In the United States, the environmental impact statement for offshore operations is prepared by the Government agency, not by the operator. Therefore, the agency is responsible for that—having worked with that agency for many years, they have excellent staff. These plans—this supplemental environmental statement is over 600 pages long. It is very detailed, comprehensive and very well prepared. I think in terms of some of the issues that were picked on, it is their role to reply to it, and I am sure that they will do an excellent job. The court will then have to take that into account.

Q71 Chair: Before I bring Simon Wright back in, you just mentioned in an answer to Mr Goldsmith your relationship with Gazprom. In terms of the concerns that have been expressed, how do you do due diligence to ensure that the standards that you expect are actually there and being met, given the various examples that Ms Lucas just highlighted?

Edwin Verdonk: At the moment that we do joint projects with a party such as Gazprom—and it is no different for anywhere else in the world—we have our own full, audited, gated process to go through every step of the investment and design. We ensure that it all follows our standards, strategies and risk management before we say yes to the investment. When we co-operate with Gazprom, that is no different from when we partner with, for example, Exxon Mobil.

Peter Velez: The other thing that I would like to add to that is that other companies also have excellent standards. Sometimes, we will enter into an agreement with another company and the contract spells out that we will look at each other's standards. Whether that

other company is Gazprom or one of the other majors or independents, if they have a standard that we feel is better, or that it would make sense to apply because it is better, we will also adopt it. It is not that we have the highest standards—we feel that we have very high standards, but we like to learn from others and adopt things that might be useful.

Q72 Chair: But would you not accept that in parts of Russia, the drilling regulations are lax?

Edwin Verdonk: I don't agree with that, no. We have been operating in Russia for quite a long time. Particularly in the Arctic—I am referring to the onshore Arctic—we have also learned something about sustainable operations from the Russians. So I do not think that what you said is right, no.

Q73 Simon Wright: Do any regulatory obstacles remain in the way of your plans for exploration or drilling in the Arctic? Would you like to comment on them?

Edwin Verdonk: Yes, I can comment on the world outside the US, and then I will ask Peter to comment on the US. In the world outside the US, whether we talk about Greenland or Norway, there is clearly established legislation and we have an established invite from those nations to explore for hydrocarbons in a responsible way. So there is no regulatory hurdle to overcome per se.

Peter Velez: From the US perspective, a series of permits must be obtained. Some of them are issued months in advance; some of them weeks in advance of the start of the operation. The process has to be followed because some of the permits are sequential to others—you have to obtain one permit before you get the next one. All that has to follow an orderly process that is well understood. Our operations always have to comply with all the permits, from not only agencies such as the BOEM—the Bureau of Ocean Energy Management—but the Bureau of Safety and Environmental Enforcement, the US Coast Guard and other regulatory bodies in the US that issue some of these permits.

Q74 Simon Wright: What is your latest assessment of the extent of environmental risk in drilling for oil in the Arctic? How has your assessment changed in recent years, particularly since you provided evidence to our last inquiry in 2012?

Edwin Verdonk: Let me say a few words on that, and I will ask Peter to comment as well. It is very important that we have a long history of science in the Arctic. Shell has put more than $100 million into investigative science to make pretty sure that we understand the environment in which we are operating and that that is as wide as you can imagine, whether it is about mammals, plants, the sea, or the ice. There is a comprehensive science base that is improving all the time, because we keep doing base surveys and checking how things are changing. We adapt our programmes to do that as responsibly and sustainably as possible.

Q75 Simon Wright: So how have you adapted in the two years since you last came before us?

Peter Velez: I have a couple of examples relating to not only Alaska but elsewhere. The first task is always to look at prevention; prevention of any incident is key. We look at the different steps. We look at prevention prior to drilling the well, during the design of the well and the drilling of the well, and when the well has been drilled and completed. There are

many steps along the way where we have to follow the prevention part. That is all part of what I call the planning process.

The second part is the preparedness process, which is making sure that we have the necessary equipment, such as blow-out preventers. A blow-out preventer is a set of valves that goes on top of the well on the sea floor. It weighs more than 200 tonnes and it has multiple sets of valves to enable the well to be shut. Prior to 2012, the standard was to put on one set of blind shear rams. Blind shear rams are a heavy set of rams—one of the valves—that crushes your pipe together to seal off the well. Since then, a second set of blind shear rams has been put on the BOP. Therefore, you have two independent shear rams that can crush and close the pipe.

We also have, for the Arctic, our own capping stack. The capping stack is another set of valves similar to a blow-out preventer that can be sat on top of the blow-out preventer in case you have some issues with the blow-out preventer, and it acts in the same way to close off the well. For our Alaska operations, we have our own Arctic capping stack, which will be located near the drilling site in case of an event. It is unlikely that we will need it, but we have taken that into consideration.

In addition to that, we have gone through additional training of personnel, and additional measures. We have added additional personnel on the rigs for the Arctic. That is one step that we have already taken, but we feel that it is necessary to have more Shell personnel and drilling experts on board the rig during the operation. The Government's Bureau of Safety and Environmental Enforcement—a sister agency to the Bureau of Ocean Energy Management—has inspectors who, in most parts of the US, go offshore regularly to inspect the rigs or the platforms. For Alaska, they have positioned people on board the rig on a 24/7 basis. There are many improvements like that, which I can go over, which have been enhanced since 2012.

Q76 Zac Goldsmith: I want to pick up on that point. You said that it was unlikely that those measures would be used. I am just wondering how you would react to some evidence that we heard this morning—analysis by the Bureau of Ocean Energy Management, which believes that there is a 75% chance of at least one spill in the lifetime of an oilfield in the Arctic. How does that match your own predictions?

Peter Velez: I would like to address that issue, because I am very familiar with it. The Bureau of Ocean Energy Management, as part of their supplemental environmental impact statement, which we talked a bit about, use statistical models based on the history of oil spills to calculate the probability of an oil spill. For a spill that is 1,000 barrels or lager—that is what they call a significant or big spill—they have assigned a probability that for the whole lease area over a period of about 50 years, from all the developments that could occur there, there could be a 75% chance of one spill of 1,000 barrels or larger. It is not a worst-case discharge, but it is their analysis of that, which has to be included in their environmental impact statement.

Q77 Zac Goldsmith: Are you saying that you do not accept the statistics that they have come up with?

Peter Velez: Well, it is a mathematical statistical model.

Q78 Zac Goldsmith: You must have done your own modelling on this. You must have an idea of what the risk is of a spill in the lifetime of an oilfield.

Peter Velez: The Government—the Bureau of Ocean Energy Management—are the ones assigned the responsibility to run that information. We get a chance to review it, but you have to remember that this is an area—

Q79 Zac Goldsmith: I understand that, but you as a company must have conducted some kind of risk assessment. You must have, in the back office somewhere, an assumption about how likely it is that you are going to have one of these disasters occur at one of your sites. Those figures must exist.

Peter Velez: What we are responsible for is making sure that we have world-class oil spill response equipment and personnel located at the site so that we can respond to a worst-case discharge.

Q80 Zac Goldsmith: To be clear, you have no assessment; Shell does not have a risk assessment that informs Shell how likely it is that there will be a major spill at one of their sites. Is that what you are saying? There is no data, there is no assessment—nothing.

Peter Velez: That's not what I said, sir. What I said is that the Government is responsible for assigning that probability. We don't have to submit a separate environmental impact statement, because they assign that. What we are required, essentially, to comply with are regulations in the US, by having under contract equipment that can meet the worst-case discharge that has been designated.

Q81 Zac Goldsmith: But how likely is it that there will be a worst-case discharge? Your investors, surely, have asked that question as well.

Peter Velez: From my perspective, it is very unlikely. These wells that we are drilling in Alaska are in shallow water and they are low pressure. We are drilling them in the open-water season, which goes from about mid-July to the end of October.

Q82 Zac Goldsmith: If you imagine that we around this table are the main shareholders of Shell, and we ask you the same question, what would your answer be? We want to know how risky what you are doing in the Arctic is. Forget the environment; how risky is it for the company?

Peter Velez: I am confident that, with the steps that Shell has taken in place, it is very unlikely that we will have an oil spill that is large, or even a small one. We drilled during the 2012 season, Sir, and we did not have a spill.

Q83 Zac Goldsmith: You are not going to attempt to quantify that risk for the Committee or for your shareholders?

Edwin Verdonk: The important thing is that we are focusing all our efforts on prevention.

Q84 Zac Goldsmith: Yes, of course, but there is still a risk there. I am looking here at something Shell put out; you describe the technological, environmental challenges related to

drilling in the Arctic as "immense"—that is your word, not mine, and no one would disagree with it. If that is the case, there is a risk; no one denies there is a risk. Among shareholders, and among the people around this table, who are trying to hold you to account, as well as among environmentalists and everyone else, frankly, there is an interest in knowing how big you think the risk is, rather than just relying on some loose regulatory framework set by Governments who are in hock to the oil industry. You must have that figure?

Peter Velez: We feel that if the risk was not manageable, we would not be drilling. Therefore, we feel strongly that we can manage all the risk, and we have taken all the steps to prevent any spill from occurring. In the unlikely event that one occurs, we have the equipment and the personnel on site on a 24/7 basis to respond.

Q85 Chair: To be absolutely clear about the response to Mr Goldsmith, you are saying that there has not been an analysis internally in Shell of what the risk might be.

Peter Velez: Not a specific number where you calculate it. We essentially have to meet the requirement that the Government puts out.

Q86 Chair: So it's about meeting Government requirements; it's not about doing your own analysis of future risk.

Edwin Verdonk: Globally, Shell has, everywhere it drills, put all its effort into the prevention of spills. However, globally, everywhere we drill, we have a set of standards as to how, in the very unlikely event a spill does occur, we can react appropriately. That is no different in the Arctic from anywhere else; the Arctic is more remote and, logistically, it is a lot more of a challenge—that is where the immense challenge comes from.

The fact is that we operate on the basis that we are not getting a spill—that is the important thing—but in the very, very unlikely case that there is an incident that causes hydrocarbons to get into the water or on the land, we have, all the time, a fully practised and set-out oil spill response plan, with all the necessary equipment nearby to deal with it. That is our approach.

Q87 Caroline Lucas: We heard evidence this morning to suggest that, for example, the relief rig may not be nearby, but 1,000 miles away in Dutch Harbor, so there are issues about the environmental robustness of what you are saying, but I want to test you on the financial robustness. Presumably, you must have done some kind of financial worst-case planning. I would be really interested to know what your contingency is for raising funds to pay all the arising costs in the event of a worst-case scenario, because your self-insurance covers only around £1.1 billion. What kind of financial oil spill plan do you have? What kind of figures are you working on?

Peter Velez: Let me address the first part, and I will let Edwin address the second part. On your first part, about the location of the rig being in Dutch Harbor, I have been in Dutch Harbor multiple times; I know where it is, and I know where the drilling site is.

Q88 Caroline Lucas: But it is not nearby.

Peter Velez: The rig is going to be in the same area. We are going to have two rigs in the same area. If you have information that the rig is in Dutch Harbor, that is incorrect; I would like to correct that for the record.

Edwin Verdonk: In terms of spill, our attitude is that—this is where the global capacity and financial strength of Shell comes in—in the very unlikely event that a spill occurs, we will do whatever it takes to manage that appropriately.

Q89 Caroline Lucas: Do you have a plan for what assets you will sell? The plan must be more than just saying, "We are going to cross our fingers, shut our eyes and hope for the best. Then, if it all goes wrong, we will work out what to do." Surely you must have identified what assets you might have to sell or other ways you could raise money, should the worst happen.

Edwin Verdonk: Like I said, we will do whatever it takes to responsibly manage a spill and all the consequences thereof. In the context of Shell—the size of the company and the financial strength that it has—that is an important statement.

Q90 Chair: So you have no contingency planning in place.

Edwin Verdonk: There is a lot of contingency planning in place all around the spill and our response to it. That is the important message that we try to convey. There is a lot of contingency planning. In the unlikely event that a spill happens, we have all the resources together to react immediately. In Alaska, the plan is to have the first reaction, in the unlikely event of an oil spill, within 60 minutes. We are doing an awful lot of contingency planning around attacking the spill, if it should occur, in the shortest time possible and with the right kit. That is the contingency plan.

Peter Velez: We are also in full compliance with the Bureau of Ocean Energy Management's requirements; they have requirements in their regulations for operators. The Government checks the requirements of the companies that are planning to drill and, if they do not meet them, the permits are not given out.

Q91 Mark Lazarowicz: This query is slightly off what we have been dealing with, but relates to the same issues. You mentioned that you are doing exploratory or preparatory work in the Barents sea and off Greenland. In those cases, what type of consideration are you giving to how to deal with a spill? I think I am correct in saying that the Barents sea is not shallow water, but I am not sure about Greenland. What different approach—if any—will you adopt in those two locations, given that, I presume, the resources of the Norwegian and Danish states to deal with spills are lesser than those of the USA?

Edwin Verdonk: Let me say in general what we are doing, then I will ask Peter to give more details. The important thing is that we in Shell approach our ability to deal with oil spill response in the same way, and those are the very highest standards. We have a huge capability around that, in terms of both our expertise and our kit. There is a Shell standard to which we operate, and that is exactly the same in every country. It has to do with the assessment you make as to where you operate, water depth, distance to shore—all these elements come in there. In Greenland and Norway, that would not be different. Locally, there may be governmental requirements that may change your plans somewhat. Very often, the

standards that the Governments require are not particularly higher than Shell standards; we find that, actually, mostly our standards are higher than those of the Governments.

Basically, in every country that we operate in, there are fully integrated oil spill response plans. Whether we do it in Norway or start to drill in Greenland, it will be the same thing.

Peter Velez: To supplement somewhat what Edwin says, we have our internal standards. I was the author of the oil spill response standard that applies everywhere that Shell operates. Essentially, we look at our standards and we apply them whether we are in Alaska or Greenland or wherever. Everywhere that we operate, we want to ensure that we have equipment, trained personnel and so on readily available for any unlikely event.

You mentioned the Barents, where there was a workshop about two years ago; I was one of the main speakers at that. We worked with all those countries in looking at their standards and requirements, and Shell looks at that strongly. On your question and Mr Wright's question, we are involved in other work, which includes further research and studies, on that topic. We were the lead company in a joint industry project looking at issues relating to oil spill response, which is being carried out on a global, non-competitive basis with all the other companies that are interested in Arctic oil spill response. That joint industry project—we refer to it as a JIP—is headed up by the International Association of Oil and Gas Producers here in London, and it involves a group of companies. It is the largest project ever, and it addresses not only improvements in technology and procedures, but improvements in science. It is a great effort.

That project started in 2012. I chaired it for the first two years, and I helped to put it together. We continue to work on a global basis and we share our work with all countries. The work is done on a non-competitive basis. All the information is published in peer-reviewed papers—its science is peer reviewed—and it is also published online so it is available to anybody who wants to access it.

Q92 Simon Wright: How have the perceptions of spill risk among Arctic countries changed over the past two years, since our 2012 report?

Edwin Verdonk: For countries such as Norway and Greenland, I have no evidence that the view of the risk of spill in the Arctic is any different from what it was before.

Peter Velez: From my perspective on the US and Alaska, we have had very strict standards, and they continue to be strict. Not only do we continue looking for ways to improve it, but we as an operator meet with the agency. Our requirements are often stricter than what we are required to do. In Alaska, we clearly exceed our requirements for oil spill response, and we made that decision as a company. The Government—the Bureau of Ocean Energy Management and the Coast Guard are both responsible for managing oil spills—clearly know that we have more equipment than we need, but we as a company made that decision. We support the decision that we made; I think it was the right decision.

Q93 Simon Wright: In conclusion, you don't think that over the past two years there has been an increased feeling that there is a risk of oil spill.

Peter Velez: From my perspective, I spend a lot of time looking at how to prevent incidents occurring. The best way of avoiding an oil spill is to prevent it, so we take many steps. There are four steps that I like to talk about when we look at oil spills. First, when we design the well, the well design is checked not only by the Government agency's drilling engineers but by multiple groups within Shell. Secondly, when we are drilling the well, the mud and casing design goes through a lot of scrutiny. Thirdly, we monitor the wells remotely; at Shell, we have remote monitoring. We have experts not only on board the rigs, but at remote monitoring centres. They act as another set of eyes to monitor exactly what is going on in the rigs on a 24/7 basis. We have one of those centres in Houston, one in New Orleans, one here in Aberdeen and one in Miri. We also have one in Alaska, in Anchorage. We can monitor the wells in offshore Alaska in any of those centres, or in multiple centres if we want.

Finally, we are ready to react with equipment and trained personnel in case of any event. The key is that we take all of those things seriously, and we look at prevention as the best way of avoiding issues. No company wants to have an incident, but at Shell we are committed to spending as much as we want to prevent incidents. If we feel that there is a risk after we have put up two barriers to prevent something from occurring, at that point we do not proceed with the project. We have to have at least two barriers to prevent anything from occurring.

Q94 Dr Offord: We have focused heavily on technology, drilling, spills and so on, but I want to ask you a question about production. You mentioned that you work closely with Governments, but what about the indigenous people in the Arctic? How do you work with them, and how do you gauge their perception of your activities and any possible impact of your activities on them and their lifestyles?

Edwin Verdonk: We work with them very intensely. Everywhere we operate, whether or not it is in the Arctic, we always engage intensely with local stakeholders as part of an a priori element of being successful in our sustainable operations. We are particularly doing that in the Arctic. One example I can give you is that, in the northern part of Alaska—the so-called north slope—last year we had more than 500 meetings with local stakeholders, people from the communities and villages, to ensure awareness of our plans, to get overall buy-in to our plans and to ensure that we listen more than talk. We want to find out from them what their worries are, the elements to which we can react and, if necessary, how we can adapt our plans to ensure that we take their concerns into account. It is an intense communication and conversation with local stakeholders.

Peter Velez: I will add to that, because I think it is an important factor not only for Shell but for me. As Edwin said, we have had 500 meetings since 2006 on the north slope. The north slope of Alaska is very large and has many villages. For example, 4,500 people live in Barrow, but there are villages with 200 or 300 people. Meetings have happened in all those villages, and I have been involved with many of them. I have essentially gone to all the different villages on the north slope. We call them "town halls." Everyone in the community is invited, and the meetings last anywhere from two hours to five or six hours. We review our plans with them, we listen to their concerns and we take their concerns into consideration.

I will give you a couple of examples of where we have listened to people's initial concerns and taken steps to address them. They were concerned that our helicopters or boats

would interfere with operations during their hunting season. We have communication centres so that we know where their hunters and so that our helicopters or boats do not go by that area. Their people are with our people in our communication bases 24/7 to tell us which routes to follow with helicopters or vessels.

We also have protected species observers on board the vessels. The team of protected species observers works on a 24/7 basis. They are biologists, but there is also someone with additional local knowledge, and they are out there looking for marine mammals and other animals. We signed an agreement with Arctic Inupiat Offshore corporation in July 2014. Arctic Inupiat Offshore is a corporation formed by the Arctic Slope Regional Corporation, which is owned by the people of the villages—they are the shareholders, and any profits go to those individuals each year. Six of the villages along the north slope of Alaska have the right to buy in, get a percentage of our project and essentially be partners. They are fully supportive of the project.

The other example I want to share with you is that we try to use as many local Alaskan companies as possible. It is very important to us to have them doing the work. I utilise a lot of them for oil-spill response, and they are very qualified and trained. A group of 20 to 25 companies signed a letter to President Obama supporting the Shell plans to go forward with the drilling because it is important not only to those companies but to the shareholders, who essentially live on the north slope. They are asking the Government to issue the permits and the supplementary environmental impact statement on a timely basis. It is important to them and to the economic development of these communities. Jobs are very important to them, and we are very supportive of that.

Q95 Mrs Spelman: I think you have been describing elements of your contingency plan. Last year, Shell contemplated the deployment of an Arctic containment system. Have there been any developments since that was made known? Will your Arctic containment system be operational by the time you come to drill again in the Arctic?

Peter Velez: The Arctic containment system has been revised, and it has been reviewed and approved by the US Coast Guard. It has been tested, so when we return to our operations, the system will be available near the drilling site. However, that is our fourth line of defence. Before that, the prevention measures that we take are proper well design, drilling the well properly, the blow-out preventer and the capping stack, so there are many steps that go before that to prevent any incident from occurring.

Q96 Mrs Spelman: Yes, I understood that from your earlier description. I want now to ask about your views on the Arctic Council. We questioned a witness from the Arctic Council this morning, and I have to say that it was a bit frustrating. We asked about the emergency prevention, preparedness and response working group and whether or not they were able to share their spill response plans, but we did not manage to get much out of them. What is Shell's perspective on the role played by the Arctic Council?

Edwin Verdonk: I should start by saying that the Arctic Council is the pre-eminent forum in which the Arctic nations are represented. From Shell's point of view, it is very important that the Arctic nations discuss the Arctic as a group and how people want to, for example, continue with hydrocarbon industry activities in the Arctic. It is important that we have the council.

If you want to know in detail our response to the oil-spill response group, Peter can tell you.

Peter Velez: I am familiar with the emergency prevention group, because I attended multiple of their meetings and presented material, as well as helping them to develop material because they asked us for information. They have an important role to play in bringing the Arctic nations together to discuss common issues.

One important thing that they did a few years back—I think it was 2009—was to issue a guideline on the different tactics and strategies for responding to oil spills in the Arctic. It is a fairly thick book that is used across the industry and by Government agencies quite a bit, and they are in the process of revising it. That is an excellent example of the work of the EPPR working group.

Another example is that last year, in May 2013, the eight Arctic nations signed an oil-spill agreement at the ministerial level. That was part of an effort between the eight Arctic nations that took a little more than a year and a half, and in which there were multiple meetings every two or three months. I was a member of the US delegation that represented the US, which was represented by the Department of State. A US ambassador was the lead person, but I was asked to participate as a delegate. I was also asked to address specific issues in the meetings because I have a lot of knowledge about oil spill response.

The agreement was signed off, and it is a good first step towards co-operative work between the eight Arctic nations on sharing ideas, equipment and resources and being able to mobilise personnel or equipment across borders without delaying the process at customs and so on. They will also start to develop and conduct exercises and other activities. It was done only a year and a half ago, so it will gain momentum as it goes forward.

The EPPR wrote the prevention guidelines. We were charged with working on the agreement, which was essentially an agreement between the eight nations, but the EPPR was working on the prevention—the operational document that went along with the agreement. I have reviewed the document and think that they have done a very good job. They asked me for some input. It is a good document to get started on. As more countries get experience, they are going to go forward and expand what they have in there.

Q97 Mrs Spelman: Okay, that is very helpful. We have gained the clear impression this morning that it is not easy to get consensus in an organisation. You have just called it the first step towards co-operation, which is good. By the same token, what is the extent of co-operation between oil companies?

Peter Velez: I would be glad to talk about that because I am involved in that a lot, and I am one of the big advocates. Having started this joint industry programme for oil spill research that I mentioned prior to this, this is the largest oil spill research programme that has kicked off. The prior one was done by SINTEF, and Shell was also a part of it. After that one ended, I essentially got the companies together, so now we have 10 companies that are working on this together.

I see oil spill response just like I see safety. It is a non-competitive area in our business. We compete on licences and reservoir data, but in the safety area and oil spill

response, the joint industry programme allows us to not only bring the experts from the companies to work together, but also the best scientists, the best research institutions and also the agencies. The agencies can be part of this joint industry project, and some of them have joined or are participating. Even though there is a group of companies paying for this, all the information is on a website: www.arcticresponsetechnology.org. As the reports get done, they are published and are available to everybody who wants to look at them.

It is the same with the SINTEF one. SINTEF is a highly respected organisation in Norway. They led the last joint industry programme. If you go to the SINTEF website, there are 33 reports publicly available to anybody. So we do not see this as a competitive area. We share information. Another example is the international oil spill conference, which is a big conference that is held every three years. It was just held in May. I ended up as the chair of it for the last three years. Next year, the European one will be held. It is called Interspill. It has been held at ExCel in London the few times that I have been here. They are very good conferences. In the third year, it will be held in south-eastern Australia. So every three years, there is a big conference where we share information. Nothing is held back in this area.

Q98 Mrs Spelman: Do you think the arrangements that you have in place for co-operation are robust enough to ensure that resources and costs get shared between oil companies at a time of spillage?

Peter Velez: In most areas, all the oil spill response equipment is shared between the companies. We set up what we call oil spill response organisations. You may have heard the acronym OSROs. One of the large ones is located here in the UK in Southampton. It is called Oil Spill Response Ltd. It is based here in London and in Southampton. They have bases throughout the world.

There is another large one in the US called the Marine Spill Response Corporation. In Alaska, we have Alaska Clean Seas. We are a member of all of those. For offshore Alaska—we are out there and we are going to be drilling, and most likely initially we will be by ourselves—we have had to essentially put in the equipment ourselves, but we are using companies like Alaska Clean Seas and some of the native corporations that have highly trained personnel to work with us in those response operations. So we co-operate; we work together; and we do drills and exercises together. It is a good way to not only learn from each other, but we can pick up ideas from each other.

Q99 Mrs Spelman: Is there anything more that you would like to see the Arctic Council do? I noticed that you said "most areas", so are there some areas where there could be improvements where the Arctic Council could help you?

Edwin Verdonk: I think that, in general, what we would like to see is a more common approach to standards in all the Arctic nations, because at the moment we find ourselves, like we said before, in a place where we have higher standards than the Governments require. I just talked about the example of Russia with Mr Goldsmith. I think that we are best off as an entire industry to have a free-flowing sharing of what we do in the Arctic, and making sure that we all, as responsible operators, adhere to the same standards. That is where the Arctic Council could do more.

Q100 Mrs Spelman: You will be very pleased to know that the Arctic Council representative did say that, precisely because they have to proceed by consensus, on the whole the Government standards are behind the developments in the industry, so that was quite interesting, and perhaps that is an area for driving up best practice.

Peter Velez: Yes. I would say best practice is a helpful response. We typically are able to build consensus pretty fast on that. It is not an area where we have difficulty. We come together very quickly. We know each other from different operations and also from our roles in companies.

Q101 Mrs Spelman: In the matter of best practice—speaking as someone who has had to organise disaster and emergency testing on a national scale—do you undertake exercises to prepare for the possibility of a spillage, and are you able to do that in real-world Arctic conditions?

Peter Velez: We have done exercises in the real Arctic conditions of Svalbard in Norway. We conduct exercises, and that is what I do most of the time; I either lead them or I am the incident commander during the incident. We do that on a regular basis everywhere that we operate. I will go to different parts of the world and lead or evaluate how they are doing, ensuring that I bring ideas from different parts of Shell. We also do those with the Government. For example, in the US, the Government conduct spills of national significance—SONS—drills. We at Shell have volunteered to be the company working with the Government on that.

For Alaska—this happened in 2012—the Government have their own programme where when we do a drill or exercise where there is table-top or deploying equipment, they participate with us, or evaluate and give us a grade: pass or fail. They conduct unannounced oil drills on us. We could be out there and they will show up and say, "Here's a scenario—start." You cannot say, "I'm in a meeting now," or, "I'm doing this." You have to take whatever steps you have, mobilise equipment and go forward with your plan. That is the requirement; we comply with that.

Edwin Verdonk: There are various links of the chain in the response plans. The frequency with which the emergency response training is done is different for the various parts. To give you an idea, on the rigs themselves, if we drill, we have a full practice once a week. Some of the training exercises can be very frequent to make absolutely sure that everybody is completely up to spec on what they have to do.

Peter Velez: Another example—even though we are not required to do this—is that when we are doing a field transfer in Alaska, we build the whole operation because we use that as training for the people working out there to essentially deploy equipment and be ready in case of an event. We do things not only to evaluate them, but to keep them trained and keep the equipment maintained properly.

Q102 Zac Goldsmith: You exude great confidence around the oil spill process. I have here a quote from a leading Canadian oil spill response company, Aqua-Guard, which says, "there is really no solution or method today that we're aware of that can actually recover [spilt] oil from the Arctic." If that is the opinion of a leading oil spill response company in a part of the world that ought to have some experience in the area, it is hard to reconcile that with the

confidence that you exuded in your answer to Caroline Spelman. How can you reassure people that you are in a position where you really can nail an emergency oil spill?

Peter Velez: What I will say is that I know the largest and smallest oil spill response companies that manufacture and provide equipment around the world. I am familiar with them, not only from knowing their equipment. However, I do not know that company, so they may be claiming that they are, but I do not know them. We deal with large European and US-based companies that provide us with equipment for responding to spills in the Arctic, such as the Norwegian company, Lamor, and Elastec, which is a US company. Those are large, reputable companies with a large presence in the market for equipment. That is where all the large oil spill response organisations purchase equipment from. Having been the chairperson for the last international conference and knowing all the vendors that were there—about 200—I do not recognise the name of that company. Thinking back, I was also involved in the XPRIZE oil spill challenge that we co-sponsored about three years ago. We look for companies from all around the world, and I do not recognise that name.

Q103 Zac Goldsmith: I can't argue with that because I do not know the company. The name of the company is Aqua-Guard, for the record. Do you believe that, among the hundreds of oil response companies that you are aware of, there is a solid consensus that Shell has an appropriate and workable spill response mechanism in place?

Peter Velez: Yes, sir. I will say yes. We essentially have purchased equipment that has not only been manufactured to work in the Arctic but has been tested to operate. We continually drill and exercise with it to ensure it functions properly. That is part of our process of purchasing equipment. Even though the manufacturer may say it is going to work, we make sure as part of purchase programme that we look at it and test it.

Q104 Chair: Just before we leave oil spills, can I check something? I understand that Shell's oil spill plan claims that oil would be released to a relatively small area on the water, even though US regulators have estimated that the hypothetical maximum discharge for wells in the Chukchi Sea could be as much as 51,000 barrels a day. Do you see a discrepancy between what your scenario states and what others are saying?

Peter Velez: I will answer, as I am very familiar with that. Our oil spill response plan has essentially to comply and have necessary equipment to respond to what is considered a worst-case discharge, as calculated both by the operator and by the Bureau of Ocean Energy Management. Those two numbers have to be complied with. The number is lower than 51,000 barrels, so that number is not accurate for the worst-case discharge.

We must have equipment to be able to respond. I think I mentioned prior to this that we have not only equipment at the site to respond but we can also cascade equipment that exceeds it. Our equipment is in three stages. We have equipment that is located within 60 minutes, so in less than an hour that equipment will respond right to the rig site. That is what we call our tier 1 level of equipment.

Our tier 2 is located between the drill site and the shoreline. Those are additional vessels and barges with spill equipment and trained personnel. Our third tier is equipment that is pre-positioned along the shoreline in different villages and is also maintained—and with personnel—in the event that a spill reached the shoreline.

Our first point of attack, which would apply anywhere in the world where you wanted to handle an oil spill, is about the quicker you get to the oil spill and the closer you are to the source. We have a term called encounter rate, which is fairly simple. The quicker you can get to it, the oil will be more concentrated, so that you can either remove it mechanically, disperse it or burn it. That is essentially what we are looking at. I think the statement you were saying is that the closer you are to the source, the better off you are. I agree with that part, though not with the volume that you stated. Our response is quick and that is why have pre-positioned for Alaska the equipment at the site.

Q105 Chair: You just mentioned burning oil as part of that response. Will you explain the research done to test burning oil? It would be different from laboratory conditions if you are doing it in the harsh weather conditions of the Arctic.

Peter Velez: There has been a lot of research done on burning oil. I have burned oil myself. If you go into the SINTEF website, you will find a couple of reports from the joint industry project that was done. There is also an excellent 10-minute video that summarises the experiments that were done on Svalbard. Several of those experiments included burning of oil. It showed that over 90% of the oil that was aggregated was burned during the burns, and that was with ice and very cold weather conditions.

Q106 Chair: So there is no problem about burning oil in those harsh Arctic conditions.

Peter Velez: No, you just have to corral the oil, aggregate it, get it taken off 2 mm to 3 mm, ignite it and it will burn.

Chair: Okay. I am going to bring in Dr Whitehead on the Polar code.

Q107 Dr Whitehead: Will Shell's vessels be Polar code compliant over the next period?

Peter Velez: The Polar code is still being finalised; so it is not yet in effect. We are going to be drilling about the beginning of July. Our vessels will move into theatre and we will be out by the end of October, so at that point we are in the open water season. Our vessels are capable of operating in ice, but when the Polar code comes into place—it first has to be approved by IMO—

Q108 Dr Whitehead: It has been approved.

Peter Velez: Not all parts of it have yet been approved.

Dr Whitehead: All the stuff on ship design, crewing, maintenance and safety has been approved by IMO.

Peter Velez: Yes, but not all the details on some of the design issues. Those first have to be approved by IMO, and then the nations themselves have to adopt them into their regulations. For example, in the US, the coast guard is the agency that goes to the IMO meetings, so the coast guard would have to adopt the polar code into their regulations, since the coast guard is responsible for vessels in the US.

Q109 Dr Whitehead: Yes, but that was not the question I asked. The question was whether you, Shell, will be compliant with the terms of the Polar code as it has already been adopted:

for example, categories of vessels? You have talked about when you are operating in waters. That would presumably be a category B vessel.

Peter Velez: When the Polar code provisions are approved and put into the US regulations, we will clearly comply. We comply with all regulations that have to be complied with. We have no choice in that. We will comply with regulations.

Q110 Dr Whitehead: So you are not now?

Peter Velez: We have vessels that are very well suited to operate in the environment that we have right now.

Q111 Dr Whitehead: Yes, but would they match the category vessels set out in the Polar code?

Peter Velez: Some of the vessels already meet the Polar code, but since the Polar code has not been finalised and integrated into US regulations, we do not yet have all those standards in place as operating requirements.

Q112 Dr Whitehead: So you will have the standards in place when you are required to, but not before?

Peter Velez: Some of the equipment has already been built to meet those standards.

Q113 Martin Caton: Earlier this year, there was an exchange of correspondence between Shell and Carbon Tracker over the question of a carbon bubble or unburnable carbon. Do you accept that there is any risk of a carbon bubble if an international agreement on emissions limits is reached?

Edwin Verdonk: No. Really, the issue here has two elements. First of all, there is the projected growth in energy demand, which according to the latest projections from the IEA will mean double the energy demand in 2050 that we had in the early 2000s. In that projection, it is important to see that fossil hydrocarbons still play an important role: up to 75%, even in the 2050 demand. That is one thing: global energy supply.

The other thing is the climate change discussion. We at Shell fully recognise climate change and recognise that it is a key issue. When talking about the issue, for us, fair carbon pricing will be an essential element of the entire climate change debate. We feel that the moment we are able to put fair carbon pricing into the equation, we will be able to compare projects like for like: for example, one project might have a smaller CO_2 footprint while another might have a bigger one. We will then also be able to see, for instance, how very effective matters such as carbon capture and sequestration—that is where you capture the carbon from a particular project and sequester it underground—can become a lot more economical once there is fair carbon pricing. What we will also see then is that gas will preferentially start to replace coal, which will also have a significant effect.

So we do not see the carbon bubble theory as too relevant. What we see as relevant is acknowledging, on one hand, a doubled demand for energy by 2050, and on the other hand, the effect and CO_2 imprint of using fossil hydrocarbons. What we are advocating is fair carbon pricing as an element of getting that balance right.

Q114 Martin Caton: In your exchange of correspondence with Carbon Tracker, which was covered by *The Economist*, you put forward the argument for discounting a potential carbon bubble because there are proved reserves covering 11 years of oil extraction, which would allow you time to use those reserves if such an agreement were made. What is your latest assessment of the extent of oil reserves?

Edwin Verdonk: What we basically see is the need for fossil hydrocarbons to still play a role for a significant time. So, if you would just ignore that and say, "Well, the energy demand is going to be as it is today, and it will just be sort of flatlining," then already a very significant amount of new hydrocarbons still need to be developed.

So, I will not try to venture; I am not an expert in that, as to how many reserves there are still left. But it's very clear that even if you would just fulfil the energy demand in the world by just flatlining the current energy demand up to 2050, then a lot of new hydrocarbons still have to come into play there.

Q115 Martin Caton: In your response to the Chair's first question about the dip in oil prices, you seem to at least envisage the possibility that this could be more than just a short-term blip, in which case will you reassess your assessment of the size of reserves that can be economically attracted at a lower price?

Edwin Verdonk: I believe that the key fundamentals or the fundamentals I have just talked about—so, the fact that the world will need energy in increasing amounts and that, at the moment, we believe that there are about 3 billion people who do not have access to the type of energy that we are used to here in the western world—will stay. So, I will not give you a number as to what I think the oil price is going to be; there are probably other people who can do that a lot better than I can. But the fundamentals are that the world will need energy and that there will be a market around that, which will regulate how these resources are going to be economically developed.

The important thing about economics is not only the volumes left, or how difficult they are to extract, but the cost base under which we develop. At Shell, we have been over 100 years in the oil industry. We are used to these, if you like, swings and roundabouts, if I may call it that, so we can cope with these changes. But fundamentally, the market will regulate where the oil price will go and fundamentally the world will need more energy, and fundamentally fossil hydrocarbons will be a part of that.

Q116 Zac Goldsmith: I was very troubled by your response to my quote earlier about the Acqua-Guard oil response and I have been tapping away on my computer since you made that comment. As far as I can see, Shell itself has been a client of Acqua-Guard; I may be wrong, but this is the information that is available. For example, the *Alberta Oil* magazine says that Acqua-Guard's clients include Exxon Mobil, Chevron and BP, and it has developed the largest units; it can recover up to 3,300 barrels an hour. It doesn't look like a Mickey Mouse company to me. If that's the basis on which you dismiss the conclusion it reached in relation to the difficulty of recovering oil after a spill, I would suggest that you look again.

Peter Velez: No, I will look again, but I can tell you that I am familiar with all the companies that are supplying equipment—

Q117 Zac Goldsmith: It literally took me three minutes to find the endless references in—

Peter Velez: And I will say this also: sometimes, there are companies that name companies that they claim they are doing business with and it's not. I multiple times get listed as a speaker at a conference and it's used sometimes to attract people to a conference, and I haven't been asked by that organiser even to be on the conference.

Q118 Zac Goldsmith: Okay. They've been published in what would be regarded as reputable and serious journals, but okay—I take your point.

Chair: I think Dr Whitehead is now going to follow up on Mr Caton's questions.

Q119 Dr Whitehead: When you had your correspondence with Carbon Tracker, you stated that you didn't see Governments taking the steps now that are consistent with the 2° C scenario. So I presume that that has informed your planning in terms of both your oil supply and hydrocarbon reserve arrangements over future years. Would that be right?

Edwin Verdonk: As you probably know, we do in Shell a lot of long-term scenario planning. As I mentioned before, we see the climate change issue as a key issue. We see that the hydrocarbon industry has a role to play in that and I already mentioned a couple of elements that might actually help that whole discussion. We have not, in detail, calculated through what the effects would be of landing exactly on 2° because that is quite a complex method. However, we already plan CO_2 into our investment decision making. For the cost of carbon in any project that we do, we put $40 per tonne of CO_2 into our economics. That means that if we were to have project A, which has a low CO_2 footprint, and equivalent project B, which has a high CO_2 footprint, then we would go for the low CO_2 footprint. All our economic analysis is based on that and so is our portfolio.

Q120 Dr Whitehead: Would your contingency planning perhaps start to take into account, say, the possibility of a climate deal being struck in Paris next year? Would your contingency planning change under those circumstances?

Edwin Verdonk: What we do in Shell is very long-term scenario planning. We have done that for many years and we also open those scenarios to the wider public.

Q121 Dr Whitehead: What sort of contingency change might that consist of?

Edwin Verdonk: The way we work that is, we look at all the elements of what the future might be and we are trying to paint a number of—call them extreme—scenarios: for instance, one where everyone globally co-operates or one where people co-operate less; where globally you have agreements on elements like CO_2 and where you don't. We play out those scenarios and we hold our portfolios against them; that is what we do. At the moment, I am not aware of any active contingency planning around it, but we are very aware of these outcomes.

Q122 Dr Whitehead: In your 2013 sustainability report you projected, which I presume was a contingency scenario, global energy demand increasing by about three quarters over the next 50 years. Does that take account of these sorts of contingency changes and the changes in the global economy over the next period?

Edwin Verdonk: I can't really comment on that particular detail, but I can put you in contact with someone who can give you that answer.

Q123 Dr Whitehead: Does any of your contingency planning perhaps involve diversifying into other forms of energy in the future or are you stuck with oil?

Edwin Verdonk: Shell has played quite a long role in renewables, which I think is what you are aiming at. We are certainly still investing in certain parts of renewables. It is a market where we see that there is still a very significant challenge, in terms of technology, to really get a large sustainable part of the energy mix taken up by renewables. There are a lot of technology steps still to be taken before we are really there. To be clear, currently about 10% of the energy mix is taken up by renewables, and 9% of that is hydroelectric, which, in itself, does not have a lot of growth. So 1% is represented by wind, solar and all the others.

To have renewables as a significant part of the energy mix in 2050, is a very significant undertaking. We feel that it would be realistic to assume that about 25% of the energy mix in 2050 could be renewables. If there are the right circumstances, dictated by the market, which would provide opportunities for a company like Shell, then we will see at that time. It is all a matter of what we are good at and that is, obviously, a long history of oil and gas. It is also about what the economic value proposition is.

Q124 Dr Whitehead: Renewable gas is closer to home—you are good at gas, so presumably you might be good at renewable gas.

Edwin Verdonk: We clearly focus on gas in general—fossil hydrocarbon gas—because we feel that if you look at the overall CO_2 footprint, in a lot of western European countries coal is a significant part of the energy mix. We feel that we would like to see much more gas replacing coal, because the CO_2 footprint is significantly lower. If we can do that globally, that will have a big impact.

Q125 Dr Whitehead: Yes. The renewable gas footprint is one tenth of ordinary gas.

Edwin Verdonk: It is probably slightly lower.

Q126 Dr Whitehead: So, are you looking at that?

Edwin Verdonk: We are looking. We still have investments in biofuel. Previously, we have done activities in other renewables, but at the moment I believe we are only in biofuel. We are not at all against renewables. It is first about looking at what we are good at, which is oil and gas. That is what we know. If the future market dictates that other opportunities are coming our way from renewable sources, we might consider them. That is our approach at the moment. We still see a significant future for fossil hydrocarbons. That is where our strength lies.

Q127 Chair: You say that you are not against renewables. You talked just now about the long-term scenario planning that you do. What input do your investors have in that? At what level inside Shell—board level or otherwise—is the debate playing out on shareholders having a say in how you take this long-term scenario planning forward?

Edwin Verdonk: I think that Shell in that respect is no different from any other company. We obviously are open to what our shareholders think. The CO_2 element that I just talked about is a key issue for Shell, and our approach to that has been widely tested with our shareholders. Like with any other company, there are general meetings and general shareholder meetings for folks to represent their opinions. In that respect, Shell is open to any view.

Q128 Chair: Finally, a quick question from me. We talked earlier about the relationship you have with Gazprom. You said that you were very satisfied going forward with that arrangement and the competence of Gazprom in respect of different areas of safety and regulation. I wondered whether you wanted to comment on whether the board of directors at Gazprom has sufficient offshore experience or special responsibility for offshore projects. With the Arctic, you are dealing with a very extreme part of the planet. What due diligence have you done to ensure that there is that competency there?

Edwin Verdonk: I think that what I can say is that we are in joint co-operation with Gazprom in one offshore project in the east of Russia. There we have been able to successfully manage our business with them, and that goes through all the levels of Gazprom. As Peter mentioned, we have been able to install our standards and keep them up in the way in which we would execute a project anywhere else.

Q129 Chair: Is that in relation to the Pechora sea?

Edwin Verdonk: The Pechora sea?

Chair: Yes.

Edwin Verdonk: I am not sure what you are referring to.

Peter Velez: I am not knowledgeable about that. I have dealt with many Gazprom people at the technical, engineering and oil spill response levels, but not at the board level. I am not familiar with the project that you mentioned. If you would like more information, we can follow up and get the right person to get you that.

Edwin Verdonk: The only clarification I can make is that the original AMI, which we signed with Gazprom, involved two areas in the Arctic, and one was an area in the Pechora sea, but that is the only relevant link I can make.

Q130 Chair: I would like to thank you for coming along this afternoon. I know that we intended to have you much earlier, and we understand the reasons why that was not possible, and we are grateful for your time this afternoon.

Peter Velez: Thank you.

Edwin Verdonk: Thank you.