

'The Future of Nuclear Power' stakeholder event

Reading, 14th September 2007

Background

The Government is currently running a consultation on the future of nuclear power. To help the UK tackle climate change and increase our energy security, it is the Government's preliminary view that it is in the public interest to allow energy companies the option of investing in new nuclear power stations.

This event was one of twelve being organised across the UK by the Department for Business, Enterprise and Regulatory Reform over July and September 07. The objective of these meetings was to hear what interested parties thought of the arguments and information contained in the consultation document. Representatives from local authorities, business, NGOs and other community-based organisations were invited to attend and share their views. Those who were unable to attend or wanted to share further views after the event were encouraged to visit the consultation website at www.direct.gov.uk/nuclearpower2007 where they could submit a response online, or send responses by post. The meeting was facilitated by Hergen Hays, BERR, and independently evaluated by Shared Practice.

Attendees

	NAME		ORGANISATION
Mr	Toby	Allen	EDF Energy
Miss	Catherine	Butler	Cardiff University
Mr	Richard	Carr	British Energy
Mr	Barry	Deller	ACTVaR
Mr	Tristram	Denton	Nuclear Industry Association
Cllr	Terry	Fraser	Harwell-Chilton Campus Stakeholder Group
Mr	Dave	Gardner	RWE npower
Mr	Ian	Gough	Wokingham Borough Council
Mr	Philip	Johnson	LIFE IC Ltd
Mr	Michael	Knowles	MechE
Mr	Denis	Linford	EDF Energy
Mr	Richard	Mayson	EDF Energy
Mr	David	Millar	Alfred McAlpine Business Services Ltd
Mr	Alan	Oulton	British Energy Generation
Mr	David	Peevers	
Mr	John	Price	UKAEA
Mr	Jeff	Stack	Shepway District Council
Mr	Paul	Starkey	Costain PLC
Dr	Graham	Taylor	Asset Performance Group International Limited
Mr	Stephen	Timms	Engineering & Technology Board (ETB)
Mrs	Gret	Woodason	Surrey Federation of Womens Institutes

Session 1: Nuclear Consultation Process

a) There was a short presentation from a BERR Government official on the consultation process, focusing on the following areas:

- The consultation objectives and nature of invitation
- The key components:
 - Consultation document and available formats
 - Consultation website (www.direct.gov.uk/nuclearpower2007)
 - Stakeholder and citizen events; attendance at Youth Parliament
 - National press advertising and search marketing activity
 - Mailing sent to 5,000 interested organisations; copies of the consultation document sent to all UK libraries on the Publicity Register.
- The independent evaluation programme
- Other work and consultations happening concurrently to the nuclear consultation
- Post-consultation process

Note: all presentation slides are available on www.direct.gov.uk/nuclearpower2007

b) The presentation was followed by a Q&A session. Below is a transcript of the questions asked by participants during the session.

Participant

Why did Friends of the Earth withdraw from the consultation?

Lead Facilitator

The day before the deliberative events, we were made aware of a press release from Greenpeace saying that they were withdrawing from the consultation. It was a group of organisations – Greenpeace, Friends of the Earth, WWF and several others. They are claiming a number of issues where they feel that this consultation is a sham. We would like to take issue with that and talk to them about the different issues.

For example, they believe the consultation should last for nine months instead of five months; that it should have used other methods of engagement; and that Gordon Brown had pre-empted the decision since he made an intervention at his first Prime Minister's Questions (PMQ).

However, the Prime Minister clarified that statement within a week, saying he was referring to the initial view taken by Government, and there is no question that ministers will want to await the conclusion of this consultation.

Greenpeace then decided not to participate in any further meetings, such as this one. Although they have registered for them, they never turn up. That is a disappointment for us, because we welcome the engagement and the debate. We absolutely want to hear what they want to say – it is a valuable contribution – and we hope that they will make substantive written contributions. We cannot force them, but we invite them to do so. From Government's point of view, nobody is excluded from expressing their views in any way that will help the consultation progress.

Participant

When we set this up under the Nuclear Decommissioning Authority (NDA), we asked people like Greenpeace and Friends of the Earth to come and join us, but they did not. I just cannot understand their agenda, since they did not even want to come to a decommissioning committee and help us along the way. It is a lost cause, to be honest.

Lead Facilitator

As I said, the invitation is there, but it is their decision, ultimately, whether or not to participate.

Session 2: Considering whether new nuclear build should be an option as part of the future energy mix

- a) A presentation was delivered which covered the following areas:
- Setting the consultation in the context of meeting the dual challenges of climate change and security of supply
 - The Government's response to these challenges in the Energy White Paper, published May 2007
 - Data contained within the consultation document on the carbon emissions from nuclear power generation
 - The possible contribution of nuclear power to security of supply
 - The need for a diverse energy mix and information on energy efficiency, demand reduction and investment into renewables.
 - Scenarios on projected carbon emissions to 2030 with and without nuclear power stations.
- b) At the end of the presentation, the following questions were posed for discussion in plenary:
- i) Do you agree or disagree with the Government's view on carbon emissions from nuclear power stations? If so, what are your reasons?
 - ii) Do you agree or disagree with the Government's views on the security of supply impact of new nuclear power stations? What is the reasoning behind your view?
 - iii) Do you agree or disagree with the Government's views on the value of having nuclear power as an option?

Transcript of stakeholder views raised in the plenary session

Participant

The consultation paper talks about 40% of the world's carbon emissions coming from electricity generation; the presenter gave a similar figure for the UK. Could you repeat it?

Lead Facilitator

It is about a third.

Participant

What is Government's target by 2029 for CO₂ emissions?

Lead Facilitator

We have no target for 2029. The target for 2020 is 26-32% lower than 1990; for 2050, the target is a 50% reduction. If you extrapolate these numbers, the target for 2029 would be about 40% on a straight-line basis.

Participant

Part of the evaluation of an option depends on its timing with regard to the need. Have you discussed when the earliest nuclear power could come on stream as part of the energy mix?

Lead Facilitator

We all appreciate that building a nuclear power station will take a considerable amount of time, depending on when Government makes its final decision. It is realistic to say that we will not see any new nuclear power stations before 2017. The impact that new build will have on CO₂ levels by 2020 is absolutely minimal; it is when we approach our 2050 goals that an impact will be seen.

Participant

When energy decisions are made, three factors always seem to be brought up: sustainability and emissions, security of supply and economics. You touched on the costs but this issue is missing from the questions – why is that?

Lead Facilitator

We have outlined the twin challenges, but we should not forget the issue of costs. Implicit on our questions, we have anticipated the market model; i.e. that Government believes that this is about allowing options. It is not Government going forward, building new power stations, but saying that we want to create a canvas that allows as many energy providers to come forward with options like renewables and nuclear, and to allow competition in the market and for energy companies to determine what is most cost-effective. This will hopefully have an impact on energy prices for the future.

Participant

The value of having nuclear power is implicit in the question. We have to, by 2050, have taken carbon pretty much out of electricity generation if we are to meet our 60% target, and there are a range of options for doing that. If nuclear is economic, that could well play a key part in taking carbon out of the generation system, but it could also include the capture and storage option and whatever share of renewables.

Lead Facilitator

Carbon capture and storage is one of the critical components.

Participant

It is worth adding that new nuclear will not be built unless the private sector decides that it is economic to build it without any Government subsidy. If it is built, it will be because it is economic.

Lead Facilitator

There are some key factors for the future, such as the price of carbon, where the European trading system is heading, and the extent to which we can achieve long-term certainty on the carbon market. Those sorts of issues will have an impact. This is quite interesting for this consultation, because people sometimes struggle with the tension: on the one hand, we are saying that it is in the public interest to allow this; on the other hand, it will ultimately be a market decision as to whether or not we will see new nuclear build. It is, therefore, a consultation about options, rather than determining a particular option for the future.

Participant

You touched on grid renewal. If there is a new nuclear programme, the grid will have to accommodate a number of large energy sources. If, however, one wishes to accommodate distributed generation, the number of connection points is critical. Are those two incompatible and who bears the cost burden of grid renewal? I assume it will not be a nuclear power station developer. Could you clarify that?

Lead Facilitator

I do not think that there is any incompatibility between having a more distributed generation, which would require smaller points of contact, and a nuclear programme, because there is going to have to be base load provision in any case, whether it is nuclear or carbon capture and storage. There are always going to be major connections into the grid. Let us also not forget that the big connections are already there and that, as power stations close down, we would be looking at replacement. For example, at Bradwell, which is a nuclear power station that has

closed down, there is a grid connection already there, which is not being used currently. If one were to replace that, one would not need any new grid reconnections at all.

What do others think about this issue of moving towards distributed generation and micro-generation, and whether or not there is a conflict between the large infrastructure solutions like nuclear and the move towards distributed generation? Is there a tension?

Participant

There is a tension because the power system is developed along the lines of large power stations, of whatever form, at the top of the network, with the predominant flow of electricity down through the network to the bottom, where we all act as consumers. The rewired network, where we have distributed, micro-generated and other resources, will require a slightly different mode of operation. Also, since these wires are pure utilities, with people being rewarded for the resources they put into them, there are forces in the networks that do not encourage the necessary reward and connection of these other technologies into the system. Something needs to be done about that and I know that DBERR is active in those areas, but it is still a big issue in terms of how these other technologies that come in lower down in the system are rewarded. It is a historical issue, but it almost a hidden barrier to entry for some of these devices.

Participant

You do have to take into account, however, economies of scale, in the sense that there is the domestic market and the industrial market. For the average consumer, we can offer micro-generation in homes and small businesses, but we also need to consider how we supply large industry. There has to be a balance. In terms of your question on connections to the grid, many power stations were built with spare capacity for grid connections, so there is opportunity, as power stations close and are built, to not have to increase the grid connection. Again, planning permission is a factor because, as well as building new power plants, one of the problems is that people do now want power lines buried or above ground. We need to look at the impact on the environment from that point of view too.

Participant

The critical point here is the scale of the challenge. Adam talked about 40 GW of new capacity being required, and the key phrase here is 'a mix of solutions'. There is no one solution here. Distributed generation is part of the solution, as are large infrastructure connected to base load units, and renewables. However, it is about enabling all of these to play their part and facilitating how they can participate in the market and connect to the system to ensure that we achieve the best balance, in terms of both sustainability and affordability. Through facilitating that, we can achieve diversity and security of supply.

In the context of nuclear, I see this as, in the first instance, very much looking at a replacement programme of new nuclear to fill the gap that is being opened up by the progressive closure of existing nuclear power stations over the next 10-15 years. That is only 10 GW of the gap that we have to fill, so we have to find a way of reutilising that grid infrastructure, considering these large blocks of base load generation that can be connected relatively easily in the context of a technical solution. It is much more of an ethical debate in terms of whether nuclear is the technology that fills the gap. Even then, as we consider as a replacement programme, as far as emissions are concerned, we are only standing still compared to where we are at the moment, without reducing emissions towards our 2020 and 2050 targets.

Lead Facilitator

Someone recently asked whether Government was slightly disingenuous to suggest that nuclear is the answer to filling the capacity gap, which will begin quite significantly from 2015. If the first nuclear power station is in operation by 2017, the solutions that will deal with our

capacity gap need to be found now and to be applicable by 2015. By that time, it was suggested, we should be far enough to be able to do without nuclear.

Participant

Gas-fired stations are being built, and will continue to be built while that gap is there. If that continues and nuclear is replaced by gas, there will be more carbon emissions for a long time in the future.

Lead Facilitator

One prediction would be that that gap would be largely filled by fossil fuel solutions rather than by renewables.

Participant

The need to fill the gap will be to produce low- or zero-carbon solutions; otherwise, we fall even further short of our targets, and that implies an expansion of renewables in that period, rather than gas, although gas is the straightforward option.

Participant

The market will deliver the lowest-cost solution, which may involve more gas or fossil fuels, which we have already seen in terms of the increased generation by coal. Only Government is looking right across the supply chain and making comments about what might happen in terms of upstream diversity of supply and what it wants to see in terms of a mix going forward.

Participant

The paradox is that Government is committed to hard figures in terms of CO₂ reductions. You have used various terms today about enabling or disallowing, but it is not clear what market levers you are going to utilise in order to try to promote nuclear or other low-carbon forms of generation. There is a paradox between having a hard CO₂ target but very ill-defined levers to drive in that direction. There is a contradiction.

Lead Facilitator

As I understand it, the levers currently are twofold: first, the establishment of a carbon market and to see the carbon price rise; and, second, in terms of new technologies – i.e. renewables – there is the Renewables Obligation. There is some funding towards carbon capture and storage. Nuclear would not benefit from any contribution, as it is a proven technology, so the renewables benefit from the Renewables Obligation and, generally, low-carbon technologies from an EU emissions trading system (ETS) and a UK carbon market.

Participant

Clearly, the success of the next and subsequent phases of the EU ETS is going to be quite critical in bringing forward any low-carbon-generation technology, whether nuclear or carbon capture and storage. Our current price of €0.05 per tonne of CO₂ is not very helpful in that respect, but in the second phase, starting next year, the forward price is pushing €20, which is quite a difference. Clearly, the scheme has to be made to work and we need tighter targets over time so that the carbon price sends out the signals that we need to invest in low-carbon technologies. That is quite important. The Renewables Obligation, with a target to increase to 15% by 2015, is also another source. If there is the funding, a successful demonstration of carbon capture and storage could potentially be developed more quickly than nuclear can be built, enabling us to continue using fossil fuels. Therefore, the Renewables Obligation and market mechanisms are pulling in the same direction, although the EU ETS depends on the EU as a whole getting the scheme right, since we are but one player within it.

Participant

Given the importance of reducing CO2 emissions, these seem like very lightweight levers to pull.

Lead Facilitator

We are not dictating particular shares in the generation sector, other than through the Renewables Obligation. We believe that it is best left to the market, with the mechanisms that are there under the carbon trading regime. If we move away from the supply side to the demand side, the Renewables Obligation makes an important contribution by 2020, but many of the White Paper measures are in energy efficiency. Adam said that, in a sense, it is a matter of running more quickly to stand still, but it is due to an increase in demand. If you reduce demand and make the supply less carbon-intensive, those measures will enable us to meet the 2020 target.

Participant

I am not convinced.

Participant

The Renewables Obligation should take effect from 2009 and will support some of the emerging technologies, but the UK is already in the lead of some of these new technologies and I think that we are missing the trick in terms of the low-carbon market overseas. There is a major opportunity for the UK to capitalise on those opportunities while achieving indigenous benefit. It is almost a failure of nerve. In Germany, there are things like the buyback tariff, which is an imaginative, 'go for it' solution that we seem to be lacking. There is a major opportunity for UK business, as well as being able to accelerate the development and deployment of low-carbon, renewable technologies. The Commission on Environmental Markets, which Government set up to look at this, is going to come out strongly in support of putting a lot of effort into innovation in order to capitalise on that opportunity. It is a market lag that will mean that we are going to miss the opportunities if we do not get things together.

Participant

I do not think it is fair to blame UK Government for the failings of the EU trading system. It just handed out permits to people wholesale, rather than auctioning them. Maybe they might learn a big lesson for the future. In terms of UK innovation, all of the companies that I work with are low-carbon companies and they do benefit from some of the arrangements that Government has put in place, although perhaps more could be done. They just need to be looked at in the round. I do not think it is fair to say it is UK Government's fault to say that the EU ETS has been a failure to date, because it is really related to the EU.

Lead Facilitator

Germany is capturing much of the international market on the renewables side, looking very much at the US, and particularly California. There is an increased wake-up call here in that UK business should and will want to capitalise on.

Participant

The Germans also do have the buyback tariff. Our policy is a market solution, so we are set against offering things like buyback tariffs. In the US too, there are arrangements that effectively subsidise the technologies as they come into the market. If we are taking that view, we need to find other market-based solutions. The reason why these technologies perhaps go into Germany is because there is a long-term commitment with the buyback tariff – it is that simple.

Participant

It is worth reminding ourselves that the Renewables Obligation provides a significant subsidy to renewables. We will get a lot more renewables as a result of that. There are limitations because of planning delays but we will get as much renewables as we can within the mix. It does not, however, provide much security of supply, as has been mentioned, because of the intermittency, and it is not that that is competing with nuclear – we need both.

Lead Facilitator

We are committed to a 2020 target of renewables providing 20% of our energy, which is incredibly challenging. We do not yet know what the 20% European target will mean in terms of a weighted national target, and there will be many discussions to be had with the Commission, but in any case, with that, with the Renewables Obligation and with the general drive towards low-carbon technology, renewables are set to grow quite significantly, which they must do if we want to have any chance of meeting these targets. However, while Government believes that nuclear can sit nicely alongside that, if you have a substantive increase in renewables, would gas or fossil-fuelled power stations better provide a better base load than nuclear power stations in terms of dealing with fluctuations? Do they really sit all that nicely together if you have a large increase in renewable electricity generation?

Participant

There are renewable technologies that are not stochastic, such as wind, and which are much more deterministic, such as tidal power, which is completely predictable and would effectively work as a low load factor power station. Work has been done which shows that about 50% of electricity demand could be supplied from tidal power in the future, and quite good institutions are sitting behind and verifying those figures, so not all renewables are stochastic.

Participant

You have to look at where we are currently and where we want to be. Tidal power is an excellent option for the future, but we have to develop the technology. I know that we have done some research into that and we have tried much of it, but given the conditions in the North Sea, we need the materials and the technology. As part of this, we need to look at where we are as a nation, in terms of manufacturing industry and our capability to deliver these technologies. Part of it is about keeping our manufacturing industry and economic regeneration going. We will debate and debate and, by the time we have made a decision, most of the technologies will be dependent on other countries, like China and India, for their manufacture and we will be unable to build them. There are questions around how we protect what we have, how we bring on economic regeneration, and how we ensure that we have a good base. There is a vast market in all these forms of energy and it is vital that we have a balanced market and explore all forms of energy.

Participant

We have a great opportunity at the moment up to 2050. If we can set the canvas and get the signals right to allow investment to flow, we have a chance. Up to now, ever since privatisation, when we lost the central planning concept for the industry, investors have been able to respond only to short-term signals, and that is why we have seen a lot of gas-fired generation, where you can plan, build and get a return on your investment quickly. If we want to have a sensible mix and to achieve long-term goals for the country of a local-carbon economy, we need to get some stability back into the market and some long-term signals that allow investors and the R&D and manufacturing industries to respond to and to get behind.

Participant

Coming back to the nuclear issue, it is almost an unsaid thing that the UK nuclear industry has not been all that successful. Our fleet of nuclear power stations has not been that reliable or economic. If we are to invest in the future, we are going to go for technology that has been developed overseas, on which there is better data. We do not confront the issue that the UK's industry has not been that successful in terms of our design of nuclear power stations and their reliability and cost. We need to come clean on that and say that, if we are to go with nuclear in the future, we need to be based more on American pressurised water reactor (PWR)-type technologies. I know that that is said in the paper, but we do not clean come enough.

Participant

A large part of what you say is correct: that we need to come clean and to be very open as an industry. Perhaps we have not been as open as we should have been in the past. However, it is interesting to point out that we currently provide almost 20% of the UK's electricity for very minimal carbon. If we are saying that that is not successful, that sends out a bright message for what we can do in the future with technologies that are very well-developed. We have four major reactor technologies that look like they could be very successful for the UK.

Participant

I will accept that, working in the nuclear industry and managing one of those power stations, where we have had technical problems. We need to learn from our history. Where we built prototype nuclear power stations, we stood on our own. Whatever we choose next has to be an off-the-shelf design with proven technology and one which is pre-licensed. We will have to go abroad for that design technology, but it does not mean that we cannot do much of the manufacturing in this country. Given our capability within our shipyards and our steel industry, it is a market that we cannot afford to mix. We may need to get a licensed reactor from abroad.

Lead Facilitator

Finding solutions that we all own is absolutely crucial but the challenges are great and we need to make decisions. Hence why John Hutton is very clear that we need to decide on a way forward in order to give certainty to the market. If we go ahead with new nuclear build, is there a skills base, essentially, that would allow the whole industry to go forward – particularly in light of countries such as South Africa, or others, who also want to proceed with new build? Are we operating from a skills base that would allow that?

Participant

This may be a red herring but I would like a reaction to it. I heard this at a Greenpeace meeting in Southampton last night. It was Southampton City Council as well as British Energy. With security of supply, the likelihood is that the larger contenders in the frame for building a nuclear programme are not UK-owned; they are foreign-owned companies. In a sense, then, if there were a new nuclear programme, it would be under foreign ownership, albeit under UK control to a point. Is there any dimension to that, which has implications for security of supply? What was produced as an argument in support of that was, would you find that situation elsewhere in Europe – in Spain or France etc. – and are we, due to our liberalised attitude, mortgaging ourselves a little? I was wondering if that was a concern that anyone had addressed in the security of supply context since, at least nominally, it should not be ignored. It may well be completely dismissible.

Lead Facilitator

Good point. Would anyone like to react to that?

Participant

I had better react. I think we are a liberalised energy market and the ownership of the different companies in the market is not particularly relevant to how the market works. If the power stations are in this country then they will be providing security of supply, whoever owns the plant. They will respond to the market opportunities. I do not think ownership of the plant is particularly relevant as long as the plant is in this country – unless I have missed the point.

Participant

I had also better come in as representing a German-owned company. The point is it will be operated as a British entity and regulated by British regulators – the full *parapluie* of regulatory bodies that allow and license the operations and any environmental aspects – and under the full umbrella of the normal security arrangements pertaining to the current nuclear operations.

Participant

In addition, I sit on a regulatory board and the situation is that the regulator will not allow anything to take place, financially, that would allow security of supply problems with the assets. Recently that has been most significantly demonstrated with Thames Water, when it went out to the Australian Macquarie Bank and they received some strange proposals to do certain things, and the regulator intervened.

I imagine the same would also happen in the electricity sector, so it is to some extent a red herring.

Participant

I should speak for a British-owned company – we are in a global market, are we not? – British Energy that operates the current fleet of several nuclear power stations in the UK with Magnox. We could not build them on our own; we would have to have some cooperation alliance with organisations, manufacturers or the utilities. That is a fact of life.

Again, the market is heavily regulated. Power stations would be built in this country; they would operate to UK law. You could see some irony in that British Energy is a registered Scottish company; if Scotland went independent, where would we be?

A point that Greenpeace may have is that if we are reliant on gas imports, if we are reliant on, for example, looking at others we have a fairly large electricity line coming from somewhere across the water in France etc., we could be vulnerable there. If I may bring back the argument. I have turned it around on Greenpeace and our friends there, in that it is the reason that it is so critically important to have our baseload-type plant built and running in this country, so that we can support our infrastructure and we are not reliant on outside forms of generation such as the link and the gas.

Participant

I wanted to pick up something that you floated a few minutes ago. I believe you mentioned the possibility that nuclear might not be the right flexible backup technology if we had a loss of renewables. If we ever reach the point where we had a lot of renewables – 40% or more for instance, which is a very long way off – nuclear power stations can operate flexibly. They do so on occasions in France and they have, even recently, been operating flexibly in Germany as well. It is a myth to say that nuclear stations cannot operate flexibly if they have to. In reality, in this country, they operate on baseload because they are the cheapest plants to run in operating cost terms. It is only if there were an enormous proportion of renewables that you would reach the point where nuclear would have to operate flexibly. If we reach that point then they could.

Participant

In support of that, I have a colleague in Germany – my plant manager is out there at the moment – doing what we call peer evaluation. In northern Germany, the nuclear power plants

are used to providing flexibility. The baseload is provided by wind turbine. The nuclear power stations come second, therefore, and so they are flexible. They do not go on and go off; they flex their load to support the wind power base. That is happening. Modern technology in nuclear power generation does not mean that they have to operate in a pure base market.

Participant

To pick up on Alan's point as to the skills shortage and ability and know-how that we have in the British Isles, Costain, like some of the other contractors, is skilling up to take advantage and be involved in this. There is a need to set things in motion otherwise, as Alan mentioned, the skills will be lost, and opportunities will be lost.

Lead Facilitator

It also takes quite a while to build up that skills base.

On the issue of foreign ownership there are some concerns about competitiveness implications, that British companies certainly will want the same advantage to invest in other countries than we allow in the UK, therefore having a level playing field. There are some quite hefty negotiations still to come, particularly in the electricity and gas markets around ownership and unbundling etc. I think there has been a lot of discussion when it was mooted a year or so ago that Gazprom may want to acquire downstream ownership, and what the implications would be. I think Europe as a collective is looking at certain agreements with third country relations, to ensure there is an equal playing field from the competitiveness angle. However, that is a slight diversion into another area, which is very interesting.

Session 3: Nuclear safety and waste

a) A presentation was given by a BERR Government official on nuclear safety and waste, which covered the following areas:

- The five main safety issues of exposure to radioactive materials, the threat of a major nuclear accident, the threat of terrorism, the potential impact of a natural disaster and the transport of nuclear materials.
- Considerations on nuclear waste
- Ethical considerations involved in deciding to build new nuclear power stations
- Financial protection and legislation to ensure that the private sector set aside funds to cover the costs of waste and decommissioning
- Managing and disposing of new waste

b) At the end of the presentation, delegates were asked to discuss the following questions at their tables and then in a plenary session:

- i) Do you agree or disagree with the Government's view on safety, health, transport and security issues?
- ii) What do you think are the ethical considerations related to a decision to allow new nuclear power stations to be built?

Summary of table discussion:

Question 4) Do you agree or disagree with the Government's views on safety, health, transport and security issues?

There was general agreement with the government's view on waste. Historically the UK nuclear industry was seen to be relatively safe when operating. It was acknowledged that plants would work under a much stricter framework of controls in the future (e.g. rigorous security measures, safe and strong designs). In the future, as technology improves, it was thought that risks and waste management might be less of a problem than currently perceived. However, there were multiple views raised around safety and security issues that must be taken into account.

Risk of a terrorist attack was uppermost in people's minds. Concern that when nuclear is being transported it is open to attacks – what would terrorists do if they got hold of a flask? The security and protection of nuclear sites and transportation must be a top priority. Participants questioned how safe plants would be, would they be able to be damaged thus creating a leak? However, there was agreement that there was always a risk of a terrorist attack with other forms of energy (such as targeting sub-stations). One participant highlighted the confusion that exists amongst the public about differences between military nuclear and civil nuclear being used for devious purposes.

Participants were generally happy to agree to trust in the government's regulations and policing of the system to avoid accidents or threats. One participant clarified that HLW fuel flasks are very strong and resistant to impact. Standards are set by the IAEA, with 40 years of nuclear transport resulting in no leaks. They felt they would still like to be updated on what testing has been done in this area.

Questions were also raised around the disposal of the waste produced.

- Where will the repositories be? It will be better to concentrate active waste in as few locations as possible to minimise potential risks.
- Levels of waste must be quantified and put into perspective (one participant clarified that nuclear waste is tiny in volume – 5 Albert Halls of high level waste in 50 years of nuclear power generation).
- There must be a decision on where intermediate waste is stored.
- Public perceptions must be changed in terms of how much waste there is, as well as how and where it will be stored.

One table felt that a community near to a nuclear site would prefer a new power station to be built rather than the expansion of a nearby airport. People understand there is a balance in life and decisions must be reached to allow quality of life to continue as it is.

It was also felt that there should be a consideration of how other countries such as Russia and US are managing and recycling their waste.

Question 5) What do you think are the ethical considerations related to a decision to allow new nuclear power stations to be built?

There were mixed views about ethical issues. Some agreed with the government's ethical considerations – they understand that there are ethical considerations for other forms of power (e.g. mining coal for CCS power stations). There will always be waste from something so we must do something with it. Modern reactors are very advanced and produce significantly less waste than previously.

Key concerns raised were:

- Where would the geological repository be situated (Finland, Sweden and France are already building them)?
- Making a huge decision which will impact on many future generations to come – they do not have a voice for something that could become a massive responsibility.

Key issues raised in favour of nuclear were:

- The significant economic impact on the local community where new plants are built.
- Combating climate change must be addressed first
- Consider the quality of life in the future. The next generation will probably want the same, if not better, quality of life and nuclear could help bring this security of supply.
- The public accept renewables in principle, but when suggested in their area people do not want them (e.g. wind farm considered an eyesore).

There were also discussions around climate change and the effect nuclear power will have on this. There is a general consensus that combating climate change is the key issue to address first. CO₂ will rise anyway and nuclear stations will help to combat this in some way, making this challenge a little easier. It was accepted that although nuclear power will have an impact on society, the causes of climate change also have an impact and their own ethical considerations. Renewables will not provide the whole answer, so fossil or nuclear will have to be used. Many felt that the key ethical consideration is which one of these is better – increased CO₂ or nuclear waste?

Transcript of stakeholder views raised in the plenary session

Lead Facilitator

What were the issues around health, safety, transport or security that you considered around your tables? Who wishes to start us off? Does anyone want to start us off with giving some insight to the wider group of what your groups considered and what the issues were?

Participant

When we were discussing waste we thought it was very important to link it with what the activity of the waste was. There is low-level waste, in between low and high, and high-level waste and

it is really important when you are discussing solutions to link them in with what the level of waste is in the first instance.

Participant

I think we were reasonably satisfied with the integrity of power stations in the light of aircraft accidents and that kind of thing, and the transport of materials, up to a point. However, I think the film glossed over the terrorist threat to the transport of materials and the opportunities that it may open up for a dirty explosion – not a major nuclear event but to a contamination. I would seek some assurances that this aspect has been properly investigated rather than put in the box of improbability.

Lead Facilitator

Okay. If anything, I think that 9/11 taught us that very few things are beyond the box of improbability and that it needs continuous assessment, in fact.

Participant

May I comment on transportation? Transportation is carried out in large flasks that weigh around 100 tonnes each, which is quite some deterrent to theft and terrorist action, I think. They are of course also extremely robust – for example against crashes or being dropped from a great height – so they are subject of very high EA standards.

Participant

I think we accepted that. We remember when trains were crashed into flasks and so on. However, if a terrorist did get hold of one, could they do anything with it? That is the question.

Participant

I had a question which I asked that has now been answered; I will tell you, though, what I asked. The concern for me was on the disposal. Knowing the problem there is with landfill sites generally, and the huge problem that all that means, is this yet another problem, and a worse problem, in effect? Where do we go? The answers have come from everywhere and I am satisfied.

Participant

One point we felt on our table was that part of the problem has been cause by the delay in the decision about what to do with the waste. The most important factor almost is to push on and do it.

Lead Facilitator

Yesterday someone asked how you can talk about creating new waste when you have not even disposed of the old waste appropriately in a long-term solution. They wanted real progress i.e. they felt we needed firstly to have identified the site and started drilling before committing to new waste. What do others think about that proposition? Have we found enough of a solution to justify new waste or not?

Participant

Working in the industry, that is always the key question and, as I said, I would like to see the Government just push on with it. We know we need to put it in an underground repository – let us start digging the hole. I think we need to push on with it. I think it is absolutely essential that the public and even people that work in the current nuclear industry want to see that question answered. Although, the answer is that we know where we want to go. Let us do something about it.

Participant

I think from the point of view of a potential investor, we want to be sure that there is a route being developed. In other words, there is an implementation plan and the timing of the repository being opened is not a big issue, because new waste can be safely stored on site for a considerable period of time. Being able to transfer waste to a repository at around the mid-century, or ideally earlier, is not a problem.

Participant

It is all very well that they need to push on with it, but the truth is it can be stored on site as it is being now. However, at Harwell now a new store is being developed, repackaged, put in, and a lot of money is put into this; there is a chance it could be on site at Harwell until 2040 before they go down the road to move it again. Harwell is going for a 100% clean site when it is decommissioned. This sends a problem out. The public that we are talking about today has to understand that we are talking a long way down the line. We are talking about handing it over to their grandchildren, or their grandchildren's grandchildren, before we do it, if we do not move on with it.

We have started at the wrong end. The Government should have started on the clean up many years ago – before we started looking at a rebuild or anything else. We should have had a place to put it before decommissioning started but we have not gone down that route so we are left with it. We have to move quickly and the only ones who can do that are in the Government itself. I think at the end of the day, for safety's sake, for people to understand that this is going to be in the ground for at least 1,000 years of its life, for safety and everything else, it has to be controlled by the Government, whichever Government that will be in 1,000 years' time. If you think back 1,000 years ago, William the Conqueror was over here. We can all be changed. We do not know what the situation is going to be but it has to be left in the Government's hands and they have to push on with it.

Participant

I think we need to be careful when we say that waste will be left in the ground for 1,000 years. I do not believe that. Technology now is advancing at such a rate. The idea is that you store it until such a time that technology can allow you to deal with it. I think we are talking of maybe a few decades. I think technology will advance, so that we can reprocess and deal with nuclear waste, in ways that we might wonder what the problem was, in terms of what we currently think. There will be issues about allowing it to decay for 1,000 plus years, but technology will move on.

Participant

I have an observation: the nuclear industry – and I have worked in it so I am not trying to apologise for or promote it – does not help with the general public when it says 'The public has to understand'. The public has had all of this fed to it over many years and has become quite upset about it at times. It does not help to come down that road. The last figures that I saw for clean-up from the existing civil and military programme was about £87 billion and that translates to £100 per man, woman and child in the nation.

Going forward, the request I would have – and I accept the business about technology and so on – is that whatever is set up would be like a pension fund. We all say that the Government is not going to fund it, the taxpayer is not going to pay it, but if these things are in existence for many years, and there is not sufficient money in the fund, then ultimately the Government would have to step in. We are not very clear about that at the moment, about how it will happen.

Participant

Not to respond directly to that, which is the financial side, but to look at the technical side slightly more, although I do not have a technical background, I think something that we need to remember, and that we need to let the public know as well, is that the original stations built over the last 50 years were built as a new technology. They were put up. That is like putting up something at home. If you put it up and you want it to stay there, you put in as many screws and as much concrete as it takes. That is obviously over-simplifying, but that is the point. New technologies are built to be decommissioned, so we need to look at the financial point but I think we also need to look at it technically. The modern reactors are put up in such a way that there are plans in place before they are built of how they will be taken down at the end of their lifetime.

Participant

On the fund, the fund will have to be enough to cover the long-term liabilities prospectively. We would expect the fund to be examined regularly by the Government to ensure that there is enough money prospectively in the fund. The money in the fund, of course, will be built up out of the income generated by the station over its lifetime and obviously the companies would stand behind that fund as well. That kind of arrangement is in place in other countries where there are nuclear stations. So I do not think there is a big risk of a shortfall looking forward.

Participant

I am always slightly uneasy about reliance on the technical fix, suggesting that technology will always find a way. The process has to be managed. There has to be the motivation to innovate and see it through and it has to take place under a stable regime.

I think once you have put the waste in a hole in the ground, the motivation to reduce the amount of time you need to leave it there is not going to be strong enough to cause that investment in technology necessarily. I am slightly uneasy about saying that it will not need to be there for 1,000 years. Until it is proven that it will not, we need to accept that as the upper bound.

Participant

I would like to add that in the UK Atomic Energy Authority (UKAEA), we are quite far along now in terms of decommissioning; it is not a mystery. People in the industry prove that decommissioning is not 'rocket science'. We are now coming up against the fact that you will have 20 sites in the United Kingdom holding intermediate level waste and this does not give the public confidence that we have the complete cycle or complete solution.

My simple view on the repository is that most of us in the industry might have a fair guess where that might be. Let us push on with it. Let us give them some money and 'incentivise' them to build it.

Lead Facilitator

I think it is interesting. Obviously we are analysing our responses from the public meetings and there were a lot. There were some things, certainly at the London event, which was quite a sizable event that I was at, about waste and safety. I think the nuclear industry, but also Government and others need to do much more work around better and clearer information provision. It seems to be a bit cloaked in secrecy and there is an element of not wanting to put everything out for obvious reasons. However, there is much more work to be done to inform the public and to ensure the public that these things have been thought of and looked at. There was a sense of, 'What is going on? We do not really know what is going on.'

There was also a notable theme that came through: the anxiety over private companies, which are inevitably money-driven, to look after really rather important issue like safety and security and waste. We have it in our question: do you agree or disagree with the investment of private energy companies? There was a definite unease and the question, certainly in looking at the

policies, will be: what is it that Government with industry and others can do to alleviate some of those fears and respond to them?

These certainly were some of the themes that came through quite strongly at our meetings. There was a general acceptance that risk is part of life, but that does not mean that people do not feel uneasy about it. Large numbers, who when initially voting on waste and security, said they feel 'concerned' or 'very concerned' about this.

Any other issues with regard to what I have just said or what people mentioned around the table? We will allow for one or two more interventions. Yes.

Participant

This goes back to an issue that was discussed earlier. The gentleman in front of me raised it. It was discussed on our table that the vulnerability, from a safety point of view, probably comes from the transportation side rather than anywhere else. While I am personally quite prepared to believe that you can drive a flask into another train at 100mph and it will probably survive, and I am quite prepared to believe that it is difficult to steal one and put it in the back of a transit van and drive off with it, we live – as you alluded to with the 9/11 – in a slightly different world. We do have people roaming around with armour-piercing grenades and what have you, these days. I wondered what kind of feedback you had had from the other public meetings about that type of threat and what, if any, reassurances you may or may not have offered up in that respect.

Lead Facilitator

I would not know in detail because we are looking at all of the material but there is an absolute unease around post-9/11 security arrangements. As someone put in one meeting, now the wildest possible scenarios, which nobody thought conceivable prior to 9/11, are actually part of your risk assessment. People are absolutely worried about it; there is no question.

What can be done? One of the issues is also to go with information provision. It portrays the idea of nuclear materials being constantly driven around the UK. That is not the case so we need to give clear information on what is actually transported and how often it happens, to understand the risk better.

Participant

There are quite tight security arrangements. We do not tell the public.

From a nuclear operator, we do dispatch spent fuel flasks. They are protected. They are escorted via the Southern Nuclear Constabulary – armed police – and I have an obligation to ensure that safety until they are loaded onto a train and they become the responsibility of another part of the industry.

It is an issue that is raised by Friends of the Earth and such like. We have had them visit our site. We have shown them what we do and how we do it etc. I have sought, as an operator, assurance from other people who are responsible then for transportation, and what they do. They assure me that they are regularly monitored. There are armed police in the vicinity of those transportation means. Precautions are taken. A lot of it is to do with security intelligence and so on. It is a known issue and something that is receiving a lot of attention and is being dealt with. It is there.

People say, 'Why do they go so slowly through public railway stations?' Part of that is for safety, of course, and then people worry when somebody could jump on them etc. All I can assure you is that people do pay attention to those sorts of things. I think it is something to which we should listen a little more. The Government should as well, in the sense that it does concern people.

Lead Facilitator

Therefore, it is a valid concern. People will want to know. While they may think nuclear power stations in very remote areas are a different story, then when it goes through an urban settlement it becomes a threat or a risk much closer to one's own home or reality. Interestingly, that raises another question, which is the last that I want to throw in. We have not touched on this. We may find it difficult to obtain a flask in this country, but there are other countries where these flasks may be much more readily available and some money will probably help. There is the issue of our nuclear build programme and what the implications are internationally, what messages we are sending to other countries. It is acceptable to go ahead with nuclear. What does that mean if political realities change? On the one hand we are saying Iran and North Korea cannot have new nuclear but we are quite happy to build it, thinking we will have a democracy and a stable environment for the next hundreds of years. However, in some countries that may only last about the next few dozen years. There are some tensions there with foreign policy. I do not know if you touched on that at all on your tables but it is a frequent theme that comes through in our meetings.

Participant

In an indirect way, one of the points we touched on was the implications of climate change for the operation of the infrastructure, in terms of the availability of raw materials, the operation of nuclear power stations, for instance the French closures in a heat wave. I am sure that the new technology will not be so vulnerable in that respect. In terms of political instability, though, around the world as a consequence of climate change, for instance economic migration and water shortage, the availability of raw materials and so on, it needs to be mapped with regard to all of this.

Lead Facilitator

Are there any others who wish to comment on this issue or is it not a concern?

Participant

I think you were alluding to proliferation. There is obviously a strong international agency for nuclear energy, which carries out regular inspections. I do not think that continuing with nuclear in this country is going to increase the risk of proliferation. We are subject, in any case, to those inspections, as are all the countries of the world that comply with that regime.

Lead Facilitator

One could argue that, for example what we are currently seeing in North Korea, it works quite well in fact. Let us hope that it will be seen through. There is certainly evidence, though, that the international community has acted and has put on relevant pressure.

Participant

To add something in terms of the work of the IAEA, it is not only combating proliferation in which the agency has a role; it is also promoting best practise in terms of safety and security aspects of civilian nuclear power generation across the world. Certainly the UK Government, including regulators, is particularly active in that regime.

Participant

Notwithstanding the monitoring and the security, it is popularly reported that there are gaps in the inventory of nuclear materials, for instance the missing plutonium and others. Is that substantiated? Is that a real issue or is it something irrelevant?

Lead Facilitator

On gaps – are you missing parts? I hope not.

Participant

I can assure you that we have very heavily regulated and, in fact, week by week we have to do an inventory. There is a key issue here, though; there is a significant difference with the 'civil nuclear programme'. We are heavily regulated, heavily monitored. Since Chernobyl, we have the International Nuclear Power Operators Association (IMPOA), the World Association of Nuclear Operators (WANO) all linked. The IAEA all monitor those sorts of areas. Every civil nuclear power plant is peer-checked and monitored. Inventory of nuclear material is monitored. I think that as part of this, we need to ensure that, from a public stance, people understand the difference between the civil nuclear programme and the military. I cannot speak for the military, and as a person, that part does bother me.

Participant

It is also worth pointing out that the enrichments required for military purposes are completely different to that required for civil purposes. They are different materials. It is not just a case of 'nuclear material' *per se*. They are as different as chalk and cheese.

Session 4: Final considerations

During the final session, attendees were asked to consider the following key consultation questions:

- i) Having considered all the issues, and in the context of tackling climate change and energy security do you agree or disagree that it would be in the public interest to give energy companies the option of investing in new nuclear power stations?
- ii) Are there any considerations that you believe should be put in place before giving energy companies the option of investing in new nuclear power stations?
(For example restricting build to the vicinity of sites, or restricting build to approximately replacing the existing capacity?)

Summary of table discussion

The majority of participants agreed with the Government's preliminary view. Conditions raised during the table discussions included:

- Restricting build to the vicinity of existing sites, as support from the community is already there and it would limit the burden on the infrastructure. There are also socio-economic factors which need to be borne in mind.
- One felt that new build should be restricted to existing capacity being replaced; another felt that as many as possible should be built.
- No restrictions on absolute share by a balanced mix is needed
- The government needs to give energy companies the option of investing asap, and therefore make a decision soon; this was echoed by another participant.
- The industry needs to be as transparent as possible as there were felt to be many misrepresentations of nuclear.
- The government needs to educate the public particularly on the difference between civil and military nuclear
- Need to adequately fund the waste and provide clarity on how decommissioning would be managed; sufficient funds need to be put aside during the lifetime of the power station. It was felt that private companies should not be held responsible for the waste after the power station had closed. A facility should be provided by Government beyond the lifetime of the operation.
- Look at the role of the government and private sector in terms of helping to ensure adequate competition with other forms of energy.
- A tried and tested technology should be used. It was felt that private companies will not be interested in investing if a novel design approach is chosen. One also felt that the Candu design should not be progressed.

One felt that it was a non-question as the option for private sector companies to build new power stations was felt to already exist.

Transcript of stakeholder views raised in the plenary session

Participant

New build has to be restricted to existing sites, not least because of the requirements for new infrastructure and the fact that existing sites have everything in place, including a receptive community, skills and infrastructure. If you go to a new site, Government's assertion that it will be putting money into it will be slightly confounding, because the whole question of infrastructure will be critical.

Participant

We thought that there was an advantage in using existing sites, but we did not see an overall restriction just to replace existing capacity. There is a need for a balanced mix over time.

Participant

Other sites that have not been opened up were available 20 years ago, such as Druridge Bay. In the overall portfolio, there will be a competitive aspect to this among the energy companies that are going to build them in terms of how they are going to gain access to the sites. Restricting it to existing sites may, then, be a little difficult, but that can be avoided, if there is a market solution, in the overall mix.

Participant

As a potential investor, another condition surrounds the waste and decommissioning funding and the requirement to build up adequate funds over the lifetime that would protect it from Government raids, for example. An associated condition would be that a long-term waste facility would be provided by Government and society to manage it over the long term, beyond the operational life of the station.

Participant

Thank you very much for allowing me to attend. My organisation has no national policy because no one has ever introduced a resolution. We had a resolution in the 1970s about nuclear waste, but have done nothing since. This has promoted us to start thinking about what we think and I am certainly going to be returning to Surrey to contact some of the attendees here in order to widen our horizons and debate what is going on. It has been fantastic to meet everyone and hear everything.

The lead facilitator closed the event by thanking the participants for giving up their time and contributing their views.