ENTERPRISE AND CULTURE COMMITTEE

Tuesday 23 March 2004
(*Afternoon*)

Session 2

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ENTERPRISE AND CULTURE COMMITTEE
10th Meeting 2004, Session 2

CONVENER

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DEPUTY CONVENER

*Mike Watson (Glasgow Cathcart) (Lab)

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*Christine May (Central Fife) (Lab)
*Mr Jamie Stone (Caithness, Sutherland and Easter Ross) (LD)

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Fiona Hyslop (Lothians) (SNP)
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*attended

THE FOLLOWING ALSO ATTENDED:

Rob Gibson (Highlands and Islands) (SNP)

THE FOLLOWING GAVE EVIDENCE:

Allan Baillie (Ministry of Defence)
Chris Bronsdon (Scottish Energy Environment Foundation)
Air Commodore Simon Bryant (Ministry of Defence)
Richard Callison (Scotland On Line)
Dr Gary Connor (Scottish Energy Environment Foundation)
Malcolm Dobson (Scotland On Line)
Bob Downes (British Telecommunications plc)
David Hilton (National Air Traffic Services Ltd)
Andy Knill (Civil Aviation Authority)
Keith MacLean (SSE Telecommunications Ltd)
Polly Purvis (ScotlandIS)
Richard Sweet (THUS plc)
Sandy Walkington (British Telecommunications plc)

CLERK TO THE COMMITTEE

Judith Evans

ASSISTANT CLERK

Seán Wixted

LOCATION

The Chamber

Scottish Parliament

Enterprise and Culture Committee

Tuesday 23 March 2004

(*Afternoon*)

[THE CONVENER *opened the meeting at 14:01*]

Broadband Inquiry

The Convener (Alasdair Morgan): Good afternoon, ladies and gentlemen, and welcome to the 10th meeting in 2004 of the Enterprise and Culture Committee.

For agenda item 1, we will take evidence from two panels of witnesses in connection with our inquiry into broadband in Scotland. On the first panel, we have Polly Purvis, who is the executive director of ScotlandIS, Richard Callison, who is the chief executive of Scotland On Line, and Malcolm Dobson, who is the chief technical officer of Scotland On Line.

I invite one person from each of the organisations to tell us what their organisations do and what their purposes are.

Polly Purvis (ScotlandIS): Thank you. As a trade association, ScotlandIS represents the software and commercial technology interests in Scotland. We have an interest in broadband as users and as representatives of the communications industry.

Richard Callison (Scotland On Line): Scotland On Line was formed in the mid-1990s as one of Scotland's first internet service providers. We offer a number of services to commercial companies and individuals alike. We are a private limited company and have offered fixed and narrowband dial-up services and broadband services from the mid-1990s.

The Convener: On the take-up of broadband, ScotlandIS comments in its submission:

"Whilst there is general supply the utilisation rates in Scotland are still very low".

Why is that the case? I appreciate that, from a commercial point of view, ScotlandIS would like the take-up rate to be better, but what, if anything, does society need to do to change it?

Polly Purvis: From an economic point of view, Scotland's geography is an issue. Broadband helps to remove that issue, and it is therefore in everybody's interest, not only in the commercial interest, to ensure that enabling technologies such as broadband are made available throughout Scotland. A number of major initiatives are now afoot to ensure that that happens.

Broadband is increasingly available in theory. The big issue now is to convince the business public and the residential public of the benefits of broadband and the efficiencies and improvements that it can bring and to convince them that it will make a difference to them. My view is that we have not yet made compelling cases in the public arena for small businesses, in particular, to take up broadband. Anecdotal evidence suggests that those small businesses that have taken up broadband have benefited from it and would not go back to their previous arrangements. Broadband can bring significant improvements, in the form of efficiencies and new ways of working, from which Scotland as a whole can benefit. We need to make that case.

Recently, some of the issues have been trivialised. The current advertising seems to be along the lines of, "It doesn't tie up your telephone line." That is not the whole issue. We should consider in more detail the ways in which businesses have drawn an advantage from broadband and how we can extend it across the business community.

As for the residential community, while all of us like to be able to surf the net, there are real benefits for government in delivering services in an e-government way. Until the residential community understands how to interact in that way, we will not be able to move forward in those areas.

Richard Callison: We tend to agree with what Polly Purvis has said. We would like there to be more focused targeting or marketing of the business benefits that broadband services can give; it is not just about getting e-mail faster. I agree that the benefits may have been trivialised in some of the campaigns that have been run. Rather than the weak, generic advertising that is being used at present, more case studies should be generated of how businesses are using broadband; other services should also be covered.

The Convener: I presume that you meet, or have contact with, people in the industry in other countries in Europe—or perhaps you do not. How are businesses in other countries reacting? What is the take-up of broadband there compared with here? The figures that we see tend to relate to capacity—in other words, they relate to the number of people who could receive broadband, rather than of those who have taken it up. What proportion of people in other countries is taking up broadband? Are we doing any worse than anyone else?

Polly Purvis: We are doing slightly worse than other countries. Last June, IDC did a study that examined the take-up of broadband in a number of countries across the world. Europe seemed to do well in that study, particularly the Scandic countries of Norway, Finland and Sweden, as well as the Netherlands. As at June last year, Sweden had a take-up rate of 15 per cent; the rate in the Netherlands was 11.8 per cent; and the rate in the United Kingdom was 4.3 per cent. There have been initiatives in other countries to encourage the take-up of broadband, and we need to examine those initiatives in more detail to see how their aims have been achieved.

To an extent, take-up rates are skewed towards newer technologies. In the software industry, the take-up of broadband is fairly universal. In more traditional industries, the pace of take-up is slower. We need to consider good practice elsewhere, although I do not have first-hand experience of that.

Mr Jamie Stone (Caithness, Sutherland and Easter Ross) (LD): You mentioned Sweden, which presumably faces exactly the same problems with geographical distance as Scotland does. I draw your attention to education and schools. Do you have anything to say on the subject of getting hold of people when they are young—notwithstanding whether they go to university or into further education—and do you think that more could be done, when young people go from education to the workplace, in the way of informing, encouraging and showcasing, which could lead to more of a roll-out of broadband in the workplace?

Polly Purvis: There are some examples of good practice in Scotland in that regard. This is a bit anecdotal, but some exercises have been run over a number of years in the Highlands and Islands to network some of the local schools, particularly small primary schools in remote areas. Broadband technologies have been used, in effect, to make class sizes bigger and to enable children to work together virtually. We should not downplay what is being achieved.

From my experience as a parent, I am conscious that schools are actively trying to roll out to students such technology skills as the use of the net for research, the use of computing to prepare exercises and the use of e-learning exercises. A number of things are being done, and there is no doubt that the younger that people are introduced to information technology, the easier it seems to be for them. We need to encourage our youngsters to be actively involved. More support probably needs to go into schools, but I am conscious that we ask teaching staff and educationists to do an awful lot already.

Christine May (Central Fife) (Lab): The first bullet point on the first page of your submission states:

> "the vast majority of Scotland now has effective broadband coverage"

However, some of the evidence that we have heard, and which I have read, suggests that there is considerable difference between the services that use dial-up and those that use cable or ADSL. When you said "effective broadband coverage", were you referring just to ADSL and cable?

Polly Purvis: It is fair to say that, for ADSL, we are getting close to coverage levels that would be acceptable for the whole population, although there are pockets in which issues need to be resolved. Once we start to drill down beyond ADSL level, there are serious concerns about the level of competition. On the whole, our conurbations have some competition, particularly through the cable companies, but many parts of Scotland, not just the remote and rural parts, do not have more than one supplier. That makes competition in the marketplace difficult. There are significant differences in services and varying levels of broadband; it can be as simple as ADSL or there can be a richer environment, given some of the dedicated resources that are available to our larger companies and to Government.

Christine May: Would the ISP people like to say something about upload speeds as well as download speeds and what difference they make, for both consumers and businesses?

Malcolm Dobson (Scotland On Line): We are focused on business offerings. We try to educate businesses to understand that broadband is not a single product. There has to be some understanding about the quality of service and there has to be a service level agreement. Our problem is that BT dominates the delivery of broadband services in the UK and in Scotland. In effect, we sell broadband for BT and we have only the service level or the quality of service that it can give us. We might have coverage for broadband just now, but as the take-up starts to kick in, the contention ratios on the exchanges will come into play and the quality and speed that everyone is publicising and evangelising about will start to deteriorate. There needs to be an understanding about what broadband really is.

Christine May: What actions should we take to help improve the position or prevent further deterioration?

Malcolm Dobson: It would be useful if other operators were able to sell wholesale broadband services. I believe that, technically, there is a way of their doing that via an inspan handover. Some of the bigger telcos are keen to do that, but I believe that the Office of Communications—Ofcom—is still considering disputes on pricing, which are preventing the other telcos from being able to compete with BT in the market.

Christine May: Do you have any other suggestions for us?

Malcolm Dobson: Scotland On Line is involved in the Borders broadband project. One of the issues around coverage concerns the 6km distance from the exchange and the quality of the copper in the ground. With wireless technology, although line of sight would still be required, the distance is not so critical. More funding for projects that include wireless technology would be beneficial, particularly in rural areas.

The Convener: I want to clarify that point. Are you talking about potential contention if demand increases and contention at the physical exchanges at the moment?

Malcolm Dobson: Yes. For example, in the Borders, I believe that the backhaul from most of the sites is based on a BT 2Mbps service. The published contention ratio is 30:1. Once the number of people who are using a particular backhaul service reaches a few hundred, they will be competing for a 512kbps service with 30 other customers.

The Convener: For the benefit of us all, perhaps you could explain some of the technical terms in that answer. What do you mean by the 30:1 contention?

Malcolm Dobson: Only so much channel or bandwidth is available for traffic to go up and down. If only one customer is using that bandwidth, it is completely available for them. If 30 customers are on at one time, the bandwidth is chopped up among them. As the take-up of broadband increases, contention problems will be created.

14:15

The Convener: Is contention a product of the physical exchange or does it relate to the link from the exchange to Edinburgh or wherever?

Malcolm Dobson: It relates to the way in which the network is designed. A significant cost accompanies backhaul from the exchange for the wireless network back to Edinburgh. That has been engineered or costed at a level that provides 2Mbps of bandwidth for every 30 customers.

The Convener: What take-up percentage would have to be reached before contention became a serious problem? How long do we have?

Malcolm Dobson: The problem is not serious, but it must be recognised that contention is an attribute of the service. Broadband is often promoted as an always-on, very fast service, but people must realise that it is not simply one thing. Different service levels are available, and people may have to pay more for a better-quality service. A business user might be satisfied with paying slightly more money for a better service. At the moment, broadband is seen as a flat one-dimensional service. It must be understood and communicated that broadband is not one thing.

Brian Adam (Aberdeen North) (SNP): Are you suggesting that if 30 users are on at the same time, somehow or other a bigger proportion of the available bandwidth can be allocated to those who are prepared to pay a little more? Would domestic customers lose out to business users who paid a slightly higher rate?

Malcolm Dobson: The BT connection that we have offers two tiers of service: a residential service that is based on a contention of 50:1 and a business service that is based on a contention of 20:1. The prediction is that residential users will have a far inferior service.

Brian Adam: We find that with remote access to Parliament services, because far too many people use it at peak times. I am sure that my colleagues will confirm that, but that is not broadband—it is only ISDN. We cannot get as far as broadband yet.

Will you elaborate on the uptake among businesses? It is obvious that the software companies that you represent will be keen to be involved, but I presume that many of their customers have old dial-up connections. Do they express frustration about the speed at which websites and instructions download? What steps can you, as commercial companies and a trade organisation, take to encourage the take-up of broadband and promote the utility of websites, video streaming and other features, beyond just e-mail?

Polly Purvis: The most that we can do is help to provide case studies of good practice. Broadband is a bit like electricity for our industry. In some areas, such as central London and some parts of the States, many companies—not just in the software industry, but in the user community—expect to have access to high-quality always-on broadband. Large corporates expect to have that facility already.

In partnership with other organisations, such as economic development agencies and local authorities, we need to support the take-up of broadband in the small and medium-sized enterprise community, by providing examples of its benefits. I suspect that most of our members' customers have access to broadband and are larger companies rather than very small companies.

Christine May: Is such partnership not happening? Could co-operation between you, for example, and the local authorities and the enterprise network be improved?

Polly Purvis: We could do more to improve the take-up rates for broadband.

Christine May: Have you any specific suggestions?

Polly Purvis: Rather than make specific suggestions at this stage, I would point out that we have good relations with organisations such as Scottish Enterprise and that a number of telcos and ISPs are our members. Perhaps we will have to work harder to create a community that can provide good examples of take-up.

Mike Watson (Glasgow Cathcart) (Lab): Ms Purvis gave some statistics and mentioned the general take-up of broadband in Scotland. The figure that Scottish Enterprise has given us for business take-up, as of the start of this inquiry, is 19 per cent. How does that compare with international figures?

Polly Purvis: It is difficult to rely on one set of figures. I know that Scottish Enterprise has claimed a 19 per cent take-up rate among Scottish businesses, but BT says that the figure is 7.2 per cent. There is quite a gap between those figures. I would be interested to see the results of further exploration of those statistics and to find out what the real figures are. We have to be sure that we are comparing like with like. When IDC produced its report, it came up with a figure for take-up in the United Kingdom of around 4.2 per cent. That suggests that 7.2 per cent is nearer the mark than 19 per cent.

Mike Watson: But that 4.2 per cent figure was an overall figure—business and domestic.

Polly Purvis: The figure was for the UK as a whole. If we bear in mind the fact that take-up in the south of England far outstrips take-up anywhere else, I suspect that the figures may not reflect the situation in Scotland.

Mike Watson: If you do not have an exact figure, it may be difficult for you to answer this question, but how do we compare for business take-up with countries such as the nordic countries that you mentioned?

Polly Purvis: All the evidence that I have seen suggests that we are some distance behind the nordic countries, even though we have many similarities in our economies and geography. That suggests that we need to reduce the gap.

Mike Watson: I am particularly concerned about take-up in the business sector. Last week, we heard evidence about a couple of alternative broadband connections. Electricity power networks can deliver such connections, and wireless broadband has been encouraged by Highlands and Islands Enterprise. What evidence do you have on such connections? Could they contribute to the further development of the business take-up of broadband?

Polly Purvis: That question is technical and would be better directed to Scotland On Line. However, I can give a general answer. We will have to come up with a variety of solutions to the problem of providing affordable broadband across the varying geography of Scotland, with competition in all areas. There is no one-size-fits-all solution.

Mike Watson: I accept that, but my question was on how those alternatives could contribute. It was directed at all the witnesses, so I am very happy if either of the other two would like to take it up.

Richard Callison: Malcolm Dobson spoke about how, in remote areas, technologies such as wireless might solve some of the problems with exchanges and some of the problems to do with the limits of ADSL technology, which has a 6km reach. I have not been involved directly in any power line carrier trials, but I know of trials that have been going on since the late 1990s using various technologies. There have always been problems to overcome. However, some of the current SSE Telecom trials seem to be bearing fruit. We await the results. That is certainly something that we, as providers, could hook into, to run services or to backhaul.

Mike Watson: I have one further question, which relates to the ScotlandIS submission. Under the heading "Key Issues", it says:

"There are opportunities for suppliers to work together to create cost effective solutions".

Later, the submission talks about "Interventions in the market". What kind of private sector and public-private partnerships did you have in mind to increase the roll-out of broadband?

Polly Purvis: There has been significant public sector intervention over the past few years, and it is extremely important that that should not be biased towards any one end of the market. In particular, we have in Scotland some innovative indigenous companies, which should not be disadvantaged by public sector interventions. In some of the pilot studies that have been undertaken, we have seen examples of partnership arrangements between telcos that could solve some of the problems in parts of the country. We should encourage that approach.

Mike Watson: Whatever the percentage of the country is in which broadband is not available—I will not get involved in figures again—what steps do the Scotland On Line representatives think should be taken to begin to close the gaps?

Malcolm Dobson: I am not sure whether this answers your question, but one of the things that we feel is important is the development of services

that run over broadband, particularly services that would not run or would be impractical on the old analogue or narrowband internet connection. That is what will drive businesses to take up broadband. Having coverage is fine, but it is of no use if businesses do not perceive the benefits. That is why we have all talked about appropriate case studies.

One simple example of a service that can be delivered effectively over a broadband network is online back-up. I think that you would be surprised if you knew the number of businesses that would be extremely vulnerable if their hard disks crashed or they suddenly tried to use a back-up tape and it failed; it would be quite telling. It is relatively simple to deliver an online back-up service, highly professionally and cost-effectively, over a broadband network; Scotland On Line provides such a service, which is not surprising. That kind of thing is crucial. Innovative software companies could develop new services. The important thing about broadband is that it is an enabling technology. In itself, broadband does not do an awful lot, but if someone can use broadband to deliver innovative services that will be of practical benefit to business, that is what will develop take-up.

Mike Watson: Are you saying that highlighting the benefits to business will be the crucial factor?

Malcolm Dobson: That, and developing services that work over broadband.

Mike Watson: Thank you.

The Convener: Are business organisations, from the Confederation of British Industry to the Federation of Small Businesses and the Forum of Private Business, doing enough to get their members involved? Do you have any contacts with them?

Malcolm Dobson: I can say only that Scotland On Line feels that the take-up among businesses is disappointing. I am being honest with you. All the talk of coverage and high-speed connectivity is misleading, because a lot of educating still needs to be done so that businesses understand what broadband is and what the benefits are.

Mr Stone: Would you go as far as to say that the Federation of Small Businesses and other organisations have a role that they should be playing and are perhaps not playing at this stage?

Polly Purvis: I would be inclined to say that there is a role for everyone to play and that there is undoubtedly a need for co-operation. The real issue is with the SME community: large companies are heavily involved in e-commerce, which requires broadband, but to get the SME community involved, one must convince it, and it takes some convincing. SMEs would probably have to invest not only in the installation of broadband, but in information technology kit. Our industry as a whole has been guilty of creating a great deal of hype about information technology over the past few years, and people have become increasingly wary of that hype. We therefore need to demonstrate and encourage best practice, and everybody who is involved in advising the business community has a part to play in that.

Mr Stone: You are being tactful. The FSB and others are quick enough to come to us about issues such as business rates, but do you, MSPs and the Executive not therefore have a role to play in getting hold of those organisations and telling them to look at what broadband could mean to their membership?

14:30

Polly Purvis: The more organisations that are involved in putting out the message, the more strongly it will be accepted. There is no doubt that different organisations take their influences from different parts of the country. The CBI and the FSB have a significant role to play and they should be included in all arrangements to promote the adoption of broadband.

The Convener: I return to the subject of capacity. If we are successful in persuading more businesses to take up and use broadband, capacity issues will arise. Other than leaving things up to the market, is there anything we can do? By definition, capacity issues will arise in places where the market has initially delivered the capability. We are finding that demand has exceeded capacity and that performance is falling off. You referred to the fact that, in many areas, BT has a virtual monopoly in the sense that no other provider has come into the market. Will not the problems caused by capacity stimulate other providers to enter the market? Is that not what markets are all about?

Malcolm Dobson: There is something of a free-for-all with regard to certain broadband connections just now. The selling point focuses on faster connections and the fact that broadband is always on. A number of earlier adopters of broadband technology indulge in peer-to-peer networking and the downloading of large files. There is already evidence that some of the service providers are starting to put limits and thresholds on the amount of data that can be transferred over the course of a month, for example. Therefore, some kind of discipline will be imposed on the use of the resource, rather than providers allowing it to be trivialised by people downloading files for the sake of it.

Broadband should not be seen as a single product—it is a range of products delivered with

SLAs. If someone's business demands a certain quality of service because that is important for the running of the business, they should expect to pay more to be able to get that quality of service. At the moment, if one buys broadband, the service is undifferentiated. People find that their traffic competes with that of the household next door, where the householder might just be downloading pictures. The current service is immature.

The Convener: Are you implying that prices might go up rather than down?

Malcolm Dobson: Definitely. One should expect to pay more for a better service.

The Convener: I presume that the more successful you are in selling your products—such as the product that allows me to save my entire hard disk every evening—the quicker prices will rise.

Malcolm Dobson: Possibly. Wholesale pricing for internet connection has come down in recent years, but the marketing literature tends to position broadband as being cheap. That is the wrong attribute to give broadband services; it is not the cheapness that is important, but the value that one can derive for one's business by using broadband services. That should be brought to the fore.

Christine May: Although one can get cheap access to broadband services, if one runs a business, one needs software solutions that are applicable to the business. Is there enough knowledge among companies of where to get those solutions, how to apply them and where training is available? Should we have been talking about that in conjunction with access?

Malcolm Dobson: There is not enough training—that is a common problem. We are dealing with businesses that struggle to set up the software. Inevitably, their IT consultants phone us up—you would be surprised by how often the IT consultant struggles to deal with the problems. There is a big skills gap.

The Convener: I thank the panel for their evidence.

Our second panel for item 1 contains a varied selection of witnesses. We have Sandy Walkington, who is director of public affairs with British Telecommunications plc; Bob Downes, who is director of BT Scotland; Richard Sweet, who is the head of regulation and interconnect for THUS plc; and Keith MacLean, who is the business development manager of SSE Telecommunications Ltd. I suspect that we know exactly what you do, but perhaps the witnesses could introduce briefly what their organisation specialises in.

Bob Downes (British Telecommunications plc): I am the director of BT in Scotland and I look after all BT's interests in Scotland.

Richard Sweet (THUS plc): THUS is a Scottish telecoms operator that provides voice, data and call centre services mainly to business customers throughout the UK. THUS has about 2,000 employees, of whom 60 per cent or so are in Scotland. Our interest in broadband reflects our ownership of the Demon Internet Ltd brand, which is an internet service provider that supplies broadband to small businesses.

Keith MacLean (SSE Telecommunications Ltd): SSE Telecommunications is the telecoms subsidiary of Scottish and Southern Energy. We concentrate mostly on infrastructure provision for broadband services throughout Scotland. We cover mainly the Scottish Hydro-Electric part of the country, but increasingly our coverage is extending to the rest of Scotland.

The Convener: I will start by following up what some of our previous witnesses said—I presume that you heard some of their evidence. They are not too unhappy with the way in which broadband has rolled out to parts of Scotland—that has not been the thrust of much of our inquiry—but they are fairly unhappy about the speed at which business, and particularly small businesses, have taken up broadband. Have you comments on that? Are you disappointed with take-up? Should we do more to increase it? Who should do what? I do not know who would like to start. As we have no regulator other than me, I will leave the witnesses to self-regulate who will speak.

Bob Downes: This is the first time that that has happened.

The situation needs to be kept in perspective. The fact is that broadband in the UK is being taken up increasingly rapidly. It is turning out to have the fastest adoption rate of any technology. However, such matters are relative. As the committee has heard from other witnesses, broadband plays a large part in regional economic competitiveness, so the issues are not where we are and how fast broadband is being taken up in Scotland, but how fast broadband is being taken up here compared with other regions with which Scotland must compete. It is important to remember that broadband has the fastest adoption rate of any technology. At a wholesale level, we alone are making 3,000 connections a week in Scotland.

Richard Sweet: We in the UK can be proud of the fact that, through the regulatory regime, we have managed to have quite strong retail competition for broadband services—more so than in many other European countries. That might have taken a while to get going, but the fact that we have strong competition is driving penetration, take-up, innovation and value for money. That is a positive note that underlines the importance of encouraging competition at every step.

Keith MacLean: The cost factor is important in determining the uptake levels. Experience in other countries has shown that if the jump from normal dial-up services, which are typically £15 a month, is too large, it is difficult in the residential and business markets to encourage people to change. Work was undertaken in the States and in Europe that showed that the equivalent of an increase of about £5 up from £15 was not seen as too difficult, but that a step of £10 or £15 made the transition more difficult.

However, experience has shown that, whatever people move on to, they do not move back again once they have got there. We all have experience of that. At the moment it is partly a question of letting people try broadband, because you then know that they are not going to go back to dial-up. We also have to lower the price hurdle and to find a simple way for people to get into broadband and then move on to faster and possibly more expensive services when they require them.

The Convener: It is interesting that you talk about lowering the price hurdle. A few minutes ago, we heard what almost seemed to be a complaint—that broadband is too cheap, or, at least, that we should not be stressing how cheap it is because that is not the main point.

Bob Downes: Price matters with any product. However, also important is the value that people get from the product. Prices have continued to fall in the UK through competition. Should you wish to buy an ADSL service, there are in excess of 150 retailers to choose from. The market is extremely competitive. However, as some other witnesses have said—and we agree whole-heartedly—coverage has ceased to be an important issue in most parts of the UK. The issues now are to do with how broadband is used and which services people will pay for. The industry is looking to introduce services right across the board. At BT, we have products that—as Polly Purvis suggested—seek to take services that a corporate organisation such as the Royal Bank of Scotland, Scottish Power or BT would have internally and make them available to SMEs at an affordable monthly cost. Such products help us to move on in leaps and bounds.

Keith MacLean: On the subject of which businesses are taking up services, our experience has shown that SOHOs rather than SMEs are far more innovative, especially in rural areas.

The Convener: I am sorry, but SOHO may mean different things to different people.

Keith MacLean: SOHO stands for small office home office. In other words, it means a single person rather than a small business. Whether it is to take up a business service or to use a residential product for business, we have found that about a quarter of the people who have moved to broadband fall into the SOHO category one way or another. SMEs with several employees are likely to be more conservative in moving to new products. We heard some conflicting statistics earlier on; that may be because many small businesses—which may comprise just a single person—are not registering in surveys and so are not counted.

Mr Stone: I understand what you are saying about SOHOs, but I want to push you a bit. You talk about SMEs. I know from experience what it is like to go to a joiners' business, a plumbers' business or a shoe shop, with one minute to convince them to go for broadband. If you good people met someone from such a business in the pub, how would you convince them, in 30 seconds, that broadband was a good thing and that they should go for it? What would your three bullet points be?

Sandy Walkington (British Telecommunications plc): I shall have a go at answering that, by giving one, perhaps trivial, example from Cornwall. A launderette there took on broadband. You may think, "What on earth would a launderette do using broadband?" Well, when people go to a launderette, they may have nothing to do but watch their underwear go round and round and round. But now, whether they are a tourist or a local person, they can surf the net while doing their laundry. I suppose you could call the place "Surf and Surf" or something. That may be a trivial example, but the launderette has achieved some real added value. It saw a selling proposition in the use of broadband.

The question about the shoe shop is interesting. However, I know that Mr Stone has had some association with Highland Fine Cheeses Ltd, which I first visited 20 or 30 years ago. If we think about that business, we can think about the web-page presence and about how it sells overseas. We can also think of online applications that can help with accountancy, for example—such packages can be bought in much more cheaply—and online training can help staff who, I presume, have to learn about, and keep up to date with, food hygiene. We have to consider all such services together. That is where—if I go back to the earlier discussion with other witnesses—organisations such as the FSB and the CBI have a role to play in selling the worth of such applications.

14:45

Bob Downes: Convincing such businesses to take up broadband is something that I do day in, day out in Scotland. The most effective tool for that is a joiner or plumber who uses broadband. When I find one, I invite that person to speak to

other joiners and plumbers who do not. That is the single best way of convincing them.

In the actnow project in Cornwall, one of the key determinants of take-up among normal businesses—not high-technology businesses—was the further education sector, which laid on customised training courses as part of the project.

I will give a couple of examples from Scotland. The Lodge on Loch Lomond Hotel put up cameras sourced from Camvista, which is the company based in Fife that does the security cameras for Network Rail and other companies. Those cameras mean that anybody in the world can see Loch Lomond at any time of the day or night, which is the perfect way to sell Scottish tourism, which is one of Scotland's biggest sectors.

The Fletcher Advisory report, which is attached to the BT submission, deliberately examined the productivity of very ordinary businesses—not software or games businesses, but businesses such as car sales, plumbers and joiners—and evidence was taken from them about why it makes sense for small businesses to have broadband.

Susan Deacon (Edinburgh East and Musselburgh) (Lab): I am keen to pick up on some recent answers. I appreciate the enthusiasm and colour that the witnesses have brought to their answers on selling the benefits of broadband, but, if I may play devil's advocate for a moment, I wonder whether they are in danger of over-egging the pudding. For example, some of the phraseology in the BT submission seems to do that. It talks about broadband

"dramatically changing the way we work, learn and relax"

and its ability to transform our lives positively and revitalise our leisure activities. I am a BT broadband user, and it is great to be able to access the *Official Report* in seconds at 1 o'clock in the morning and to watch the Parliament's webcasts, but I am not sure that broadband is therefore positively transforming my life and my leisure activities. Although it is important to market the benefits of broadband, we do not want to create a society in which people feel that they are inadequate individuals if they do not have it.

I do not say that to make a flippant or even philosophical point; I ask you to pin down how vital you think broadband is to our future way of life. That request is directed particularly, but not exclusively, at the BT witnesses. The BT submission contains an extremely strong sales pitch for broadband and its benefits. However, over the page, it notes that the gaps in coverage that exist for broadband are just the same as for a series of other things—gas, Channel 5 and Freeview—that, I imagine, BT is not suggesting have the same life-enhancing properties, although my children may question that statement where access to CBeebies is concerned.

I am making a serious point. Will you give us a sense of how important you think broadband is and will be in a societal sense? I hear what you say about specific business benefits, for example—we have heard a great deal about those from other witnesses—but the transformational properties of the technology that you imply in your submission are something much bigger again.

Bob Downes: The transformational aspects to which we refer can be put into five categories that demonstrate how important broadband technology is. As Malcolm Dobson said, it is about the services that are provided over broadband—the word "broadband" will disappear. Only 18 months ago, when I talked about it, people asked me to explain myself and stop using jargon. That is how quickly the term has been adopted.

The first of the five areas is the effect on the gross domestic product of a country such as Scotland. There is good evidence that GDP will improve through the adoption and use of broadband technology. That is a competitive issue.

The second point is that small-business productivity is considerably enhanced through the use of broadband, not least because, if other countries' SMEs are using it and ours are not, we are at a disadvantage. We have discussed that, and I will not go over it again.

The third point concerns the effects on public service delivery. NHS 24 is a telephony-based service for the citizens of Scotland. A transformation would take place if that service could provide remote diagnosis at home—we can think what that could mean for elderly people. It costs a fortune to look after an elderly person in a hospital, in a residential home or in their own home. If elderly people could obtain over a broadband connection services in which their families could trust, that would transform their lives and those of their families. Such services could also run through education services and all aspects of child care.

The fourth aspect is the opportunity for Scotland to grow an industry that involves the games and software businesses that previous witnesses spoke about. Ubiquitous broadband would provide a platform for companies and educational institutes to grow and sell their wares. That is exactly what Finland did with the mobile phone industry and there is no reason why that cannot happen here.

The fifth aspect concerns personal learning and development and changing the way in which people work and accommodate family commitments. That includes the issue of people who are excluded from many of the benefits of living in Scotland. We have only just begun to

explore that matter, which offers opportunities. Digital technology over broadband can help to improve people's lives dramatically.

Those are five huge subjects, each of which can be quantified.

The Convener: Has Jamie Stone finished his questions?

Mr Stone: I will ask a question later when we move on to a different subject.

Brian Adam: I declare an interest, as I am a shareholder in Scottish and Southern Energy.

I will ask each witness questions in turn. Will the witness from THUS give us an idea of what a beta test is? The term may mean a lot to you, but it does not mean much to me. The reference is in the first line of the last paragraph on page 1 of the THUS submission. As well as answering that technical question, will you give us an idea of the proportion of the

"customers in housing estates or business parks on the outskirts of towns"

who are

"often outside the ADSL delivery limit"?

Richard Sweet: The term "beta test" is industry jargon for testing before the formal launch of a service. Typically, volunteer end users take the service and co-operate in ironing out teething problems before it is formally launched.

I do not know what proportion of housing estates and business parks are outside the range of exchange coverage. Perhaps the BT representatives have an answer.

Bob Downes: I will start with the headline figure. If all the triggers that are set on exchanges in Scotland came right, about 97.8 per cent of the Scottish population—

Brian Adam: That is not what I am referring to.

Bob Downes: Hang on—that is just the headline figure. The distance from an exchange at which broadband can be received varies throughout Scotland. In one place, when the exchange is enabled, the figure might be as poor as 50 per cent of the people who live in that area being able to receive broadband. However, two other exchanges might have almost 100 per cent coverage.

Having said that, about a year ago, coverage extended to only 2.5km from an exchange. That figure is now up to 6km and we are working on extending coverage further, to ensure that broadband goes out as far as possible from an exchange.

Brian Adam: Will you give us an idea of the current scale of the problem?

Bob Downes: We are undertaking detailed analysis now. Throughout Scotland, the figure is probably between 2 and 3 per cent.

Sandy Walkington: There is nothing unique to Scotland about the situation, which concerns the laws of physics and how copper networks work. The situation is the same in the States, Sweden, France and Germany. All our research and development people are working together across international boundaries to find ways to solve the problem.

We find increasingly that we can push out further the reach of broadband across copper networks. We have also to consider different technologies, such as wireless technologies, to provide infill. The problem is common throughout the world.

Brian Adam: The problem is not just distance though, is it? The nature of some of the exchanges, and the materials that are used, are also relevant. The bulk of your exchanges, although not all of them, use copper. Some problems in reaching the wider population do not relate to distance or to the use of copper.

Sandy Walkington: It is somewhat ironic that before broadband was even thought of, telephone companies around the world were steadily upgrading their networks. At one stage, optical fibre was seen as the answer to a maiden's prayer. Different places—most of East Germany, for example—were recabled with optical fibre, as were parts of Scotland and parts of England. Ironically, DSL technology does not work over optical fibre cables. We are therefore having to retrofit in order to provide broadband services. That will be done. We are very sorry about the problem for the people who live in those areas, but we will deal with it. It was one of the strange unanticipated results of having previously been too ambitious with technology.

Bob Downes: Aluminium and what is known as TPON were used in part of Aberdeenshire, when the Westhill area was built up during the oil boom. As Sandy Walkington says, that was sensible at the time. However, we would be talking about a figure of 4,000 if everyone in such areas in Scotland were to want to take broadband.

Brian Adam: Nevertheless, it is very frustrating for those who cannot get it. Can you give us an idea of the timescales for resolving what you consider to be relatively small problems?

Bob Downes: I cannot give you exact timescales. Suffice to say that the problems with broadband so far have been resolved pretty quickly. Reach is a good example of that.

The Convener: I think that Mr Sweet wants to respond to an earlier point.

Richard Sweet: I just wanted to make it clear that the point that we were making in our submission was that radio was an especially suitable solution for rural areas, where populations tend to be more spread out and further from the exchange. If the average percentage of households that are too far from the exchange is 2 to 3 per cent, the percentage in rural areas will be rather higher. That is why radio is a worthwhile technology in such areas.

Brian Adam: Some of my constituents get rather frustrated when the focus is put on rural areas; significant parts of my constituency have the technical problems that we have been talking about but are not rural. However, I am glad that the providers acknowledge that there is a problem.

Perhaps Keith MacLean of SSE Telecom would clarify another technical point from his submission. What are "VOIP services"?

Keith MacLean: They are voice services that are provided over the internet. If you have a broadband service, you can get voice service alongside the data service on the link. The letters stand for "voice over internet protocol".

Brian Adam: Is that a means of introducing more competition into the telephony market, as well as the broadband market?

Keith MacLean: The idea is already feasible; a lot of people have simple voice communication over the internet. At the moment, you generally have to have a computer at the other end in order to establish contact. In time, it will be possible to do that with standard telephony equipment.

Brian Adam: My final question is for Bob Downes or Sandy Walkington of BT. In section 4.2 of your submission, under "Commercial Barriers", you say that

"the original targets"

for trigger levels

"were set at a level representing 50 per cent of the break-even point".

What percentage of current exchanges are now at twice that level? In other words, are you starting to make money?

Sandy Walkington: We are not yet making money on broadband. We are required to have a business case for our regulator that demonstrates that we will make money. We are required to do that because we are held to have significant market power and are therefore not allowed to introduce products to the marketplace that are not profitable. That is to allow others to compete. However, we will make money.

The triggers have been set in such a way as to provide some comfort to the regulator, and indeed to us, that when we invest in and deploy broadband, we will make a return. As a rule of thumb, we said that the trigger point is about halfway towards the break-even point. Obviously, we hope that many more people will take up broadband when it is available.

15:00

Brian Adam: As you set the trigger points for individual exchanges, and as a number of them have been enabled for some time, can you give us an idea of how many exchanges are now at twice their trigger level and how long it took them to get there?

Bob Downes: Some exchanges in city areas might have a 30 per cent take-up, which is extremely high. However, it is unlikely that many exchanges in Scotland, if any, are at the level that you mention.

Brian Adam: The point of the question is that if we want broadband to be successful, we need to reach that point. If you or your competitors are to make the investment, there must be a return within a reasonable period of time, especially as alternative technologies might supersede broadband. It would be helpful to the committee if you could give us an indication, perhaps in writing, of when you expect that to happen.

Bob Downes: The business case was put forward and agreed with the Office of Telecommunications. We agreed a payback period for the generality of the exchanges in the UK.

Brian Adam: That was in anticipation of what might happen. I am looking for information on what has happened.

Sandy Walkington: We can try to give you that information. We announced a set of targets for the UK. The first target was 1 million customers by the summer of last year, and we reached that target. The next target was 2 million customers by this year, and we have reached that. We said that there would be 5 million customers by 2005. We are reaching the benchmarks that we agreed with Oftel, but we will come back to you on that point.

Murdo Fraser (Mid Scotland and Fife) (Con): This is an interesting panel, because it includes three private sector providers of broadband who are all in competition with one another. I enjoyed reading the submissions, particularly the one from THUS plc. Reading between the lines, I sense some frustration; perhaps the company thinks that, in Government circles, BT is in some way a preferred provider. I would like to explore that. If the other panel members want to come in, I welcome their views, but I will address my questions to Mr Sweet.

The section on public sector intervention in the submission from THUS makes a number of comments. It refers to the project for accessing telecoms links across Scotland—project ATLAS—in relation to which I believe we are awaiting a European ruling on a possible breach of state-aid rules. How does Mr Sweet envisage public sector assistance being provided to get round some of the difficulties that are identified? Would such assistance be on the basis of open market tenders or is there another way to create a level playing field among the various providers?

Richard Sweet: Open market tenders must be the basis for all public expenditure, to ensure that money is spent as effectively as possible. In the submission, I make the point that the way in which the project's commercial structure is framed has a big impact on the scope for private sector involvement and for subsequent competition. In the UK, we have seen a huge variety of models, but we believe that the models that maximise the scope for private sector involvement in competition are by far the most successful. The Scottish Borders rural broadband network is a good example of public sector intervention being confined to the wholesale level. The retailing of services is left to private sector companies, who purchase capacity from the wholesale provider in competition with one another.

The principles that we would like to see are adherence to state-aid and public procurement rules and competitive procurement wherever possible. In addition, we would like maximum involvement from the private sector to be actively sought, along with private sector investment and maximum competition.

We are all competing with one another. However, Scotland accounts for quite a small proportion of the UK market and there might be less scope for competition here than there is in other parts of the UK. There is a need for existing players to work together in partnership with one another and with Government. We have mentioned the partnership that we recently set up with BT to provide broadband in the islands. That is a good example of how we can work together in Scotland.

Murdo Fraser: You seem to be suggesting that the principles that you have outlined have not been applied strictly until now.

Richard Sweet: In project ATLAS, which is still subject to a decision, clearly the principles have not been followed. There are other instances in which they have been followed well. It is important to follow best practice rather than worst.

Murdo Fraser: Before I invite the other witnesses to respond, I will ask you a second question in a similar vein. It relates to another issue that you raise in your submission—the question of weighting of telecommunications infrastructure. Apart from making the welcome comment that the rate of taxation is 9 per cent higher in Scotland than it is in the rest of the UK, which will be a familiar theme to committee members, you mention the fact that BT's infrastructure is rated on a different basis from that of the other providers. Will you elaborate on that point? What is the reason for the difference? How do the different regimes operate?

Richard Sweet: I will not go into huge detail. In simple terms, BT's rates are based on the profits that it makes from services. BT is unusual in the telecoms industry in that at the moment it is making a profit. We hope to do so very soon, but at the moment we and other alternative network operators are rated on a different basis. The rating authorities have come up with a way of valuing our assets that, unfortunately, is based on notional values that were determined at the height of the telecoms boom. One problem that we have at the moment is that the values—and, hence, the return that we can get from them—are lower than the rating authorities deem them to be.

Keith MacLean: I agree with much that Richard Sweet has said about intervention. Where possible, services should be procured on the basis of tender. There has been the promise of good examples of that in projects such as the pathfinder project, which seeks to procure in an aggregated manner for the public sector. We believe that that can act as a useful base for further investment in infrastructure in the areas that the project covers. We would be delighted to see the project move forward, so that action can be taken. Even on a smaller scale, in one or two of our pilot broadband projects, we have seen that simply having a few schools take service on a commercial basis is enough to provide a full business case where previously only a partial one, based on commercial customers, would have been possible.

I reiterate what Richard Sweet said about rates and other public sector costs, such as Crown Estate costs, which can affect a business case very adversely. It is ridiculous to have a kilometre-based fibre-rating regime that totally penalises remote communities that need tens or hundreds of kilometres of cable to reach them. It seems wrong to apply the same rating principles to those communities as apply in urban areas.

I go one stage further in respect of the opportunity for the public sector to play a role. There could be intervention in infrastructure, rather than service, to help the most remote areas. It will be impossible to roll out the same infrastructure everywhere in the UK, and particularly everywhere in rural Scotland, on a fully commercial basis. There is an opportunity for more direct intervention

at the infrastructure level. Once the infrastructure is in place, there will be a sustainable, on-going economic model at the service and maintenance levels that will not require any on-going intervention from the state.

Bob Downes: The situation in Scotland has changed quite markedly in a year. We will have gone from 40 per cent of the population having access to broadband to something like 78 per cent of the population being covered by the end of March. Remarkably, that has been done in partnership with the public sector. For example, Highlands and Islands Enterprise represents one of the best partnership models in the UK. Parts of the Highlands did not stand a chance of getting broadband, but they do now, and that led to the partnership with THUS. As far as competition is concerned, we pioneered with HIE satellite broadband in the UK. That brought in eight other satellite providers—I do not know how many there are now—to provide a competitive service.

We will continue to push on with those partnerships but, for reasons that others have stated, in remote rural areas they will only go so far, after which direct intervention will be required. You get to the point of needing to keep up with what is happening elsewhere. Northern Ireland, Cumbria, the north-west of England, Monmouthshire and Lincolnshire have gone out to public tenders. There is no reason why that should be delayed for us. It can be done in parallel with notification to the European Union, and it is technology neutral and supplier neutral. Time is of the essence, but it is right at the edge. It is down to somewhere within the last 10 per cent.

The Convener: Various members have indicated that they have supplementaries, but as they will all get to come in later, I will wait until we reach them.

I have a point of clarification on the rateable value. You are saying that the rateable value for a kilometre of cable is the same throughout the UK, but the difference is the business rate, which is higher—

Keith MacLean: No. There has been a concession to move from approximately £1,000 per kilometre per annum down to perhaps a half or a quarter of that, which is welcome, in that it is moving in the right direction. However, for a kilometre of fibre in the south-east of England, the potential traffic density from customers is orders of magnitude greater than the traffic over a kilometre of fibre going up to the northern isles or out to the Western Isles, and reducing the cost to a half or a quarter will not address that fundamental distortion.

Mike Watson: I want to ask SSE Telecom about the trials that it is running in Crieff and Campbeltown, using electricity power networks to deliver communications, about which we heard last week. You might have heard me ask these questions earlier. Will you say a little bit about the pilots, for example about where they are, and—if you have evaluated them—how valuable they will be in the future for rolling out broadband in rural areas?

Keith MacLean: We started off almost two years ago with the pilots in Crieff and Campbeltown, which were extremely successful in technology terms. They delivered what we wanted them to do, so much so that we invested in marketing pilots in Stonehaven and in Winchester in the south of England. On a commercial deployment level, the only question for us now is not whether it works, but whether Scottish and Southern Energy can successfully market broadband services to a level at which we break even. We have achieved that level in Crieff and Campbeltown, but now that the ADSL infrastructure has been rolled out, there are few places where there is no competition. The issue for us is how we fare in a competitive market.

However, there are still quite a few communities where there is no alternative. At the moment we are considering starting up some community broadband options so that if 10 or 15 users around an electricity transformer take broadband, we can roll out the service to those areas. Technically, it works fine; we are just thinking about how far we should roll it out, whether it will be only to areas where there is no alternative, and how much of that we do on a competitive basis.

15:15

Mike Watson: You have touched on the subject of my second question, on the part of your submission that has the coloured diagram. I am not any more informed after looking at it than I was before, but it seems that you are able to set lower trigger levels than BT has set. How do we fill the gap in areas in which ADSL is not going to be available? Have you the technology to do that, and what would be the constraints on filling that gap in small chunks of 10 or 20 triggers?

Keith MacLean: With regard to the transformers that have any number of users, as long as 10 or 20 of them get together and are prepared to sign a contract, we can roll out broadband on a fully commercial basis. The question about how we would get the trigger to less than 10 is one I mentioned earlier. If there were a couple of schools or an anchor client in the public sector, we could probably reduce the trigger level of 10 to five. That is a means of getting to those final few who are not in a small community of 10 or more.

Mike Watson: My next question is for Mr Downes and Mr Walkington. You clearly say that

BT's policy is to have 100 per cent broadband coverage. Is BT able to go any further than the areas that are currently covered by ADSL, even if the trigger numbers are small? Should that be left to SSE Telecom, say, if it is already using a smaller model?

Bob Downes: Let us get the scale right. There are 600 exchanges left in the UK, 399 of which are in Scotland. Whatever we do will require some form of direct intervention to get to the final few per cent, which could be 2 to 3 per cent or could be up to 10 per cent, depending on how quickly we want to do it.

It is a large geography. There are a lot of problems with what is called backhaul, which means getting back from the small exchanges to the core network. All of that has to be wrapped up together and a combination of technologies will do it—ADSL, probably combined with radio wireless, perhaps power lines and satellite. We have some exchanges on the islands that serve only four or five people. We have to keep the scale in perspective.

Time is of the essence. We have to decide what we mean by 100 per cent. It strikes us that this is a one-shot opportunity and that we have to do it now. The whole discussion of broadband will be about how it is being used; we saw that in the previous evidence. We have the chance to make sure that as many people as possible get broadband. For us, that means trying to get those final 399 exchanges done, irrespective of size, through a combination of technologies.

Mike Watson: Your submission also mentions the direct investment policy adopted in Northern Ireland. You finish off by saying that you are determined to get 100 per cent coverage and that you believe that the Executive should adopt that. Have you spoken to the Executive and found it to be unwilling to go to that level? If that is the case, do you think that direct investment is a way of bridging the remaining gap?

Bob Downes: Yes, with public open tender. We have been in discussion with the Scottish Executive for quite a long time. The partnerships that we have talked about have come out of those discussions, as has the excellent work on demand and promotion of broadband. Clearly, the Executive is taking some care over the decision. Given what has happened with state-aid considerations, that is only right and proper.

Something needs to happen, and happen quickly. It is happening in other parts of the United Kingdom, so we should get on with it. Europe's policy on this is becoming a lot clearer as well. The European Commission now believes that, in remote areas of Europe, there needs to be a more direct intervention model. That does not appear to cause the Commission a problem with competition policy, and it sits more easily than it did perhaps a year ago, when there was a lot more confusion.

Mike Watson: To read between the lines of your answer and your submission, do you feel that the Executive is not doing enough, and that that could prevent Scotland from moving ahead—or catching up with—the other parts of the UK to which you referred?

Bob Downes: If we do not act soon there is a risk that we will fall behind the rest of the UK in coverage, but the Scottish Executive and its agencies have led and have shown the way in the UK on demand promotion. Demand and coverage sit together—they cannot be separated. We have to drive demand. If we consider the coverage in the Highlands and Islands, take-up there is higher than the average for Scotland; it is one of the highest in the UK. The industry welcomes demand promotion, but it is time to get the coverage right, because that will recede as an important issue for the rest of the UK.

Mike Watson: My last point is for Mr Sweet. Murdo Fraser said that he particularly liked the THUS paper, and that he found it to be different. I thought that it was different too—it is almost unique. Apart from the introduction, it is one long whinge. It whinges about standard charges and contract terms for siting equipment on private land. It whinges about state-aid rules and about public sector intervention. It whinges about restrictions on utility street works and about the rate of tax on telecoms fibre. Then, for good measure at the end, it whinges about BT, and says that it has a preferential position. I am not saying that those whinges are all without merit, but why does THUS identify those issues as being so serious, and why does it place so much more stress on them than it does on other aspects that we have heard about during the inquiry?

Richard Sweet: I am pleased that the paper has been so well read. So far, THUS has invested about £500 million—more than half of it in Scotland—in rolling out its network. We have delivered high-street broadband services to a large number of businesses, public sector institutions and schools throughout Scotland. We are doing our best, and all I was trying to point out in the paper is that there are measures that Government could take to make it easier for the private sector to deliver its targets, without the need for direct public sector intervention. We would like to play our part, and we will do so, but there are things that could be changed to make life easier for us and to improve the commercial incentives for us to invest.

Mike Watson: I had probably better leave it there, convener.

Chris Ballance (South of Scotland) (Green): I want to take a little further BT's coverage projections. BT says:

"if all current trigger levels are hit, broadband exchange coverage … will reach 98 per cent."

Is that likely? If so, going by past experience, when do you think that it is likely? We have heard other witnesses complain about being told, "Oh, wait for ADSL or BT broadband; it is just around the corner. It will come in six months," so they delay getting satellite or whatever, only to discover, three years down the line, that they are still waiting. How realistic is that projection and when do you expect it to happen?

Bob Downes: The rate at which the exchanges that we have put triggers on are triggering is astounding us. Of the 89 that triggered in the UK the week before last, 28 were in Scotland. People have had concerns about some exchanges, such as Kemnay, because they are small and appear to have a high trigger. Kemnay went through 500 registrations. That seems to be linked to exchanges where there is a high level of community activity—no matter what the trigger level in an exchange, it triggers. That may or may not land us with a bit of a problem, but we are now building up a backlog of exchanges.

That should explain why it is quite difficult to answer your questions. If you had asked me six months ago, the estimate of when the 97.8 per cent target would be reached would have been much further away, but the gap appears to be closing. I do not know whether we will reach a plateau, but I would say that it is likely. Some exchanges with communities are highly active, and so they will trigger, but others are different. At the rate at which the exchange in Possil, in Glasgow, is going, it does not stand a chance of triggering. Those of you who know that part of Glasgow will understand why that is.

It is a mixed bag. If direct intervention were made, we would end up enabling exchanges that do not have triggers, as well as a proportion of the exchanges that do have triggers, but for which the chances of their triggering seem a long way off. It is a matter of political judgment for the Executive how quickly it wants everybody in Scotland to have broadband. Exchanges are triggering much more quickly than we expected.

Chris Ballance: If you reach the 98 per cent target, around 50,000 homes will be left without broadband—you have spoken about there being 125 households for each of the exchanges in the 2 per cent that would not be covered. Going by the averages, do you have any idea how many businesses might be encompassed?

Bob Downes: No, I do not. The people who will probably know the answer to that question are Highlands and Islands Enterprise and Scottish Enterprise. They could give a more accurate answer than we could get from going through our customer base. Quite a lot of people use broadband at home for a small business, which would not be registered. A lot of people who take our home product are in fact businesses.

Chris Ballance: From what we have heard so far, I suspect that the answer to this will be that you do not know, but the final figure from the questionnaires that I am trying to get at is to do with the target that BT has set of 100 per cent coverage by 2005.

Bob Downes: No, excuse me; we did not—

Chris Ballance: BT is saying that it will need input from the public sector for that. What size of cheque are you talking about?

Bob Downes: First, I should point out that it was the Government that set the target—it was Stephen Timms, the Minister of State at the Department of Trade and Industry. Ben Verwaayen, the BT chief executive, was happy to endorse that last November.

The size of the cheque is determined by what the definition of 100 per cent is. I am not going to be put into a corner over that, because if it is defined by exchanges, that is different from defining it by communities, which is different from defining it in relation to everybody in Scotland.

The price has come down a lot over the past two years. Technology has changed and the rate of growth has changed. A variety of factors have made the price lower than would otherwise have been the case. If you were to push me into a corner over the matter, I would say that it would involve tens of millions of pounds, rather than hundreds of millions of pounds.

Keith MacLean: Theoretically, the 100 per cent target is possible, if we include the satellite provision method. It is not too difficult to work out the combination of up-front contribution, subsidy and on-going costs that would need to be incurred to enable satellite usage for the people at the extremities of coverage. Theoretically, we are there, and that gives a baseline for the numbers involved.

Christine May: Good afternoon, gentlemen. To go back to something that was said earlier, I have bought shoes online on behalf of my family—both Highland dance shoes and skateboarding shoes—so it is possible. I have also had the dubious pleasure, courtesy of CamVista, of looking at the St Andrews Old course, shrouded in mist, when all that I could see was a vague blob, which I think was the Royal Mail van delivering the post.

What I want to talk about, however, is market stimulus: not now, but about five or 10 years from

now. I think that we will reach the current targets relatively quickly, and with relatively little further intervention from the public sector. I am less concerned than Mike Watson is about the rivalry between BT and THUS—which I am sure they will sort out for themselves.

The second-last paragraph of page 2 of the THUS submission discusses the BT roll-out and Scottish Enterprise needing to revise targets and so on. That was a direct reaction on the part of the public sector to a market stimulus. Bob Downes has talked about future use and the areas that might, but do not currently, use broadband. That is dependent on better speeds, increased bandwidth and more targeting of businesses, both by type and by the nature of what they do, and of residential customers, who may use the technology just for pleasure but who may also be customers of those businesses. Would you like to talk about the future and about the market stimulus that you think might be needed to get you to where you are now with existing product?

15:30

Bob Downes: You will see that the nature of the service providers' advertising for their products has already begun to change, because they are anticipating full coverage. That applies whether you are a small business or are using it at home. We introduced flexible bandwidth—either in straight product last week, or on trial—which is the shape of things to come. It is called liquid bandwidth or turbo broadband, as I saw it referred to yesterday. It means that, when you are downloading a film, your broadband will increase for that period and then come down again. That is one example.

We are also introducing a rich media product—something that is very important for us in Scotland—which provides a platform for local service providers who want to sell their goods and wares. It will be available to customers who come on to that BT or other service provider site, which changes the nature of the product. You have heard about Communicator being able to use voiceover broadband; we have launched that. We are also introducing and piloting remote management systems, which elderly people, children or people who need care in their home can use. We will be introducing—as I know others will be—a whole range of products for small businesses.

All those things will really drive the demand for broadband and will change the nature of how we use the technology. Wireless networks in the home will change how homes are designed in future. That is already happening. The jam factory development in Southwark is already designed and on sale as a wireless environment for home workers. Being able to move around the home allows you to buy all kinds of products, from a hi-fi to a fridge, that are designed for broadband use. Those things will drive demand hugely. The advertising that we did last year was about broadband awareness and we spent £35 million on that. Our focus has now moved to marketing that is much more targeted at specific users, whether for entertainment, health care or insurance.

Sandy Walkington: I suspect that we just do not know. If one looks at the mobile phone market, one sees how SMS—short messaging systems—has absolutely exploded, and nobody in any of the mobile companies gave that service a second thought. It was a thing on the side that was part of the technology, but it was not marketed. In the end, it was kids—teenagers—viral marketing and word of mouth that drove it. I suspect that in five or 10 years' time, we will all laugh at what we were forecasting today. We will be astonished by what is being done.

Think about electricity. The national grid and central power stations were started to provide electric light. That was what electricity was initially financed on and there was a justified business case for supplying electricity in towns to provide lighting, rather than using gas lighting. Nobody foresaw all the domestic appliances or television and radio. With broadband, we are at the start of an astonishing growth curve, which takes me back to Susan Deacon's comments about our hubris or hyperbole. I genuinely think that we are only beginning to grasp what can be achieved with the technology, but it is important for social cohesion purposes that everybody can access it.

Christine May: I find it interesting that you are not suggesting that there is anything at this stage that we or the public sector should be doing, or did I miss that?

Sandy Walkington: Let me come back on that. There is an enormous amount of evidence that there is a magic dust around public-private partnerships, and we refer in our evidence to the actnow model in Cornwall, which has been astonishingly successful. There seems to be some real 2+2=10 arithmetic there, where the combination of the private sector, of higher education in the form of Cornwall College, of the local chambers of commerce and the county council has driven a take-up of broadband that is incredibly good, given the fact that Cornwall is a relatively poor area. It is the last bit of Britain that gets objective 1 funding from the EU.

The second highest take-up of broadband in Wales is in Caerphilly, which is the poorest area of Wales. Again, that has been achieved through a public-private partnership. There is a magic dust that we do not quite understand, but it seems to

provide real benefit. As Bob Downes said, broadband can have health-related applications, but many other citizen-type applications could be driven through broadband, which has the advantage of making systems more user-friendly and accessible, and which could save huge amounts of money, which must be good for the taxpayer.

Richard Baker (North East Scotland) (Lab): My first question is for Keith MacLean and follows on from Mike Watson's questions. Your submission talked about your

"ability … to set small local trigger levels between 10 and 20".

How many communities might benefit from that and what is your timescale for delivering such services?

Keith MacLean: The number of communities will depend on the rate of exchange activation elsewhere. The number depends on how many communities will be left that fit into that category. To be honest, I could not easily give a number, but I could provide some numbers subsequently, if you are interested.

For us, the main issues have been solved. The remaining one is setting up the processes that will allow people to get the information about which transformer station they are on and who else is on it. Because the stations are so small, that is not like saying that if a person's telephone number begins with 01XYZ, they simply have to find other people with the same number. We must give people that information, which is what we are doing at present. We hope to start in the next month or so with a number of communities that we have been talking to. As long as we have the processes in place, we will be able to follow on from that soon.

Richard Baker: That is interesting. I would welcome that information.

My second question is about the investment that is required to create a level playing field of infrastructure throughout Scotland. I was interested to hear that satellite technology might have a role in that, given that high costs are obviously still associated with that technology. You say that you are looking for additional Executive support for that. Would that really be a one-off investment or would there be on-going costs to maintain the infrastructure that would require additional support from the centre?

Keith MacLean: If the system is to work, it can be only a one-off investment that creates a sustainable on-going model. We need a common price. With electricity, regardless of how much more it costs to connect people in remote areas, we still charge a common rate. The public sector must think about creating that sort of environment for broadband. If we leave it too long, people in disadvantaged rural areas will ultimately have to pay more for broadband. We need a system that will create an on-going, even price structure.

Susan Deacon: I want to give the panel members an opportunity to flag up any potential barriers to development that they feel have not been covered or to elaborate on any of the specific points in the submissions. I am conscious of Mike Watson's earlier question, but I guess that one person's whinge is another person's constructive criticism—I thought that the points about the impact of street works on development and so on were interesting. I do not want you to repeat anything that you have told us already, but to mop up any issues that we have not covered—however apparently mundane they may be—that limit either the development or expansion of connectivity or take-up.

Bob Downes: The important issue that I want to raise takes us back to the question that Christine May began to develop. First, we can take a lead in the use of broadband and public services that will benefit citizens. Scotland is uniquely placed to test these things because we have such a widely distributed population. Our size also enables us to deal with NHS 24, for example; it is a lot easier to deal with than NHS Direct. That situation provides a platform for smaller businesses to trial things as suppliers and there are wonderful opportunities to do that in education and health.

Secondly, when the dotcom crash happened we thought that the knowledge economy—or the internet economy—was not that important any more; that is the impression that I got in a private sector business in Scotland. However, Forrester Research took the projections that were made before the dotcom crash for online retail sales, internet users and households with broadband and it discovered that the maximum time lag for those things is only two years, so it is far from being the case that things that were driving the knowledge economy, which became disreputable in the crash, have gone away—they have not gone away at all. Driving broadband through all our services and small businesses has again become critical if we are to gain a competitive edge for Scotland.

The last statistic that I have on those developments is that last month China took the lead in ADSL broadband connections worldwide. There are 10 million broadband connections in China; it has passed the United States. It is a bigger country and a developing country, but the speed of growth is phenomenal. We must learn those lessons. Broadband is on the agenda. It is not about coverage; it is about use, but we cannot leave anybody behind.

Richard Sweet: A lot of the discussion today has focused on ADSL-type broadband for

residential consumers. I would also like to emphasise the importance of what we refer to as high-speed broadband services, which are typically used by business, delivered over fibre. Those services are just as important for the economic health and competitiveness of Scotland. There is a role for public sector institutions, as one of the major procurers of high-speed broadband, to take a lead in making forward-looking investments that stimulate the supply side and enable suppliers to deliver similar services to other businesses in Scotland.

That links in to one of the final points that I made in the submission—it is about street works. I believe that the private sector can do a lot of the roll-out that is needed. There is sometimes a trade off between direct public sector intervention, with subsidy, and the alternative approach of creating a more favourable regulatory environment for investment. Street works is a good example; if we avoid placing too many restrictions on telecoms operators' ability to dig up the streets and lay new fibre that will deliver greater availability and more businesses will be within economic reach of our network.

Keith MacLean: I echo what the other two gentlemen have said. Projects that are under way, such as pathfinder, can make a significant further contribution to creating demand and creating an infrastructure that supports some of the weaker areas.

We need to examine regulation. I know that the matter is reserved to Westminster and is dealt with under the Communications Act 2003. However, in relation to other utilities—such as ourselves or Scottish Water—parts of the Communications Act 2003 are structured very much along the lines of the old telecommunications industry. The act does not recognise the opportunity that there is to develop further telecommunications infrastructure around the other utilities' infrastructure. There is a good opportunity to clarify regulation and legislation on that and on the New Roads and Street Works Act 1991, wayleaving, and rights and how problems are dealt with, which will make it easier for private industry to invest.

The Convener: There are no further questions, so I thank the panel very much. It has been a long evidence session, but that is because the material has been very interesting.

I will suspend the meeting for 10 minutes. I would like us to resume promptly at 5 to 4.

15:44

Meeting suspended.

15:55

On resuming—

Renewable Energy Inquiry

The Convener: We recommence the meeting with agenda item 2, which is our inquiry into renewable energy in Scotland. I welcome Rob Gibson, who is attending for this item.

Our first panel consists of four witnesses: Andy Knill, who is the manager of surveillance and spectrum management from the Civil Aviation Authority's directorate of airspace policy; Allan Baillie, who is director of estate management for the Defence Estates agency of the Ministry of Defence; Air Commodore Simon Bryant, who is air officer Scotland and Northern Ireland; and, last but not least, David Hilton, who is the general manager of operational policy and investment for National Air Traffic Services Ltd.

Perhaps the witnesses could start off by briefly outlining what each of them does, which is perhaps not as clear in some cases as it is in others.

Andy Knill (Civil Aviation Authority): Good afternoon. I am responsible for surveillance and spectrum management policy within the directorate of airspace policy of the Civil Aviation Authority. We are responsible for the planning and use of all UK airspace structure to satisfy the needs of all aviation users. Within that, we have the policy lead for the Civil Aviation Authority for co-ordinating the impact of wind energy developments in the UK.

Allan Baillie (Ministry of Defence): I am a director with Defence Estates, which is an agency within the Ministry of Defence that is charged with providing property solutions to defence needs. We are involved in energy efficiency, town and country planning and many other building and property aspects. Today, I will lead on the town and country planning aspects.

Air Commodore Simon Bryant (Ministry of Defence): Convener, let me correct one thing. As air officer Scotland, I concentrate entirely on your country, as Northern Ireland has dropped off the perspective.

I represent the Ministry of Defence as a practitioner on a day-to-day basis. My two roles are to act as a higher-level representative of the Royal Air Force in Scotland and to have responsibilities for Royal Air Force Leuchars in Fife.

David Hilton (National Air Traffic Services Ltd): Operational policy and investment has a wide remit, but we basically cover everything from

providing an interface with other air traffic service providers, such as European agencies, right down to things such as the environmental impacts on air traffic provision in the UK. My department is also responsible for all investment in new systems within National Air Traffic Services, from radars down to air traffic control centres and so on.

The Convener: I start off by quoting paragraph 2 of the Ministry of Defence memorandum, which states:

"There is a perception among the stakeholders that MOD are a major stumbling block to wind farm development."

The previous page of the memorandum quotes from the energy white paper, which states:

"MoD has objected to a third of all recent on and offshore wind energy proposals."

Does not the second statement confirm the first, showing that the MOD is a major stumbling-block to wind farm development?

Allan Baillie: That could be said to be true statistically, but it depends on which statistics are chosen.

The Convener: I chose the statistics that were given in your paper. Will you explain them?

Allan Baillie: Indeed. We see most applications at the pre-planning stage, where the statistics show that we tell a high number of developers that we regret that we are unable to go along with their proposal as it stands. However, the statistics for last year show that there were only three occasions on which we objected formally to a planning application.

16:00

The Convener: I will narrate from my experience in Dumfries and Galloway. I was told a couple of years ago by the representative of a power company that it had given up trying to apply for wind farms in that area and was sending away any farmer who came to it, because no proposal was worth even considering. The effect of the MOD objections is to kill off any proposals before they get to the planning stage. The MOD does not have to object at the planning stage because people know before then that they will be stopped at that stage.

Alan Baillie: You may interpret the situation in that way if you so wish, but we wish to work on an individual basis with developers who wish to put up wind farms. We want to work with them in a way that allows them to achieve their aim.

The Convener: I bring us to the example of Dumfries and Galloway, which is one of the tactical training areas. What progress have you made in that area in assisting to bring projects to fruition?

Alan Baillie: Are you looking for particular statistics?

The Convener: I am conscious that, although there is a drive for renewable energy and we are in a fairly windy part of Scotland, Dumfries and Galloway is not covered with wind farms—nor would I wish it to be—but we seem to be going to the opposite extreme, where there are hardly any.

Alan Baillie: For those people who wish to develop a wind farm in that area, we have fairly good mechanisms in place by which they can approach us and I hope that we can work with them to get their plans through to approval.

I do not have any statistics for that particular area with me today because I did not come prepared to talk about individual cases. However, I can tell you the statistics for the overall number of applications that we have received since 1999: there have been 818 proposals in Scotland. In 2003, there were 353 proposals. Our rate of approval to date has been about 45 per cent. That is not as good as we would like it to be.

Murdo Fraser: It seems that one of the primary reasons for MOD objections is the need to maintain low flying. In many of the communities that I represent, given the choice between wind farms and low flying, the people would choose low flying any day, but that is by the by. How relevant is low flying as a training method in the medium to long term? As warfare becomes ever more sophisticated, is it not true that the purposes of low flying are defeated by technology?

Air Commodore Bryant: That depends entirely on the assumptions that one makes, with whom one is heading off to war and against whom one will fight. It might be a war or a conflict-prevention scenario. The reason for flying and training at low level is that it is one means of taking the conflict to the opposition, whoever that might be.

The most recent conflict in the gulf is an example of a heavily American scenario in which flying at medium level was a practical way of conducting much of the business, although not all of it. One operated under a large American electronic warfare umbrella against that particular opposition. An alternative assumption would be to participate in a European operation in which the same coverage would not exist. A higher priority would be placed on the requirement for low flying.

There are a number of other scenarios whereby one would not be looking at a full-scale fight; it would be more of an infiltration, whether to take photographs, to prevent conflict or to provide assistance after conflict. In such situations, the only way of getting into an area might be through low flying, dictated either by the circumstances or by the weather.

The Ministry of Defence prides itself on conducting operations well. One depends on flexibility; one is always trying to unhinge the opposition and maintain the advantage. Self-shackling is not a helpful way to begin one's preparation.

Murdo Fraser: Can we draw from what you have said that the requirement for training in low flying is likely to continue at the current level for the foreseeable future, or is it likely to diminish?

Air Commodore Bryant: The requirement to train at low level will remain. My judgment on whether it will diminish depends on the shape of the Royal Air Force in future. A white paper that is being considered at Westminster will undoubtedly lead to changes in the size and shape of the Royal Air Force, and indeed the size and shape of all the services. I have no information about what will happen. If the numbers went down, my assumption is that there would be less low flying.

Christine May: I will turn the convener's question on its head. In the concluding paragraphs of your submissions, you say that you are committed to finding solutions and supporting the Executive to achieve its targets. I note that the Ministry of Defence's submission talks about the work that it is doing with QinetiQ and NOI Scotland Ltd of Kirkcaldy to develop blades that will not interfere with systems. Will the witnesses talk a bit more about what they are doing, how far their work has got, and whether it will conclude satisfactorily to allow the Executive to achieve its objectives? If that work will not conclude satisfactorily, why would that be and what impact would that have?

Andy Knill: On the civil aviation side, we have delegated a lot of responsibility for safeguarding to individual airports and air traffic service providers—it is for them to make expert assessments of the impact of a development. The future role of the Civil Aviation Authority is to try to meet the Government's requirements in terms of transport policy while creating a process in which wind energy development can take place. To that end, we envisage that the CAA's role will be to develop better guidelines to help the aviation industry in its assessment of the impact.

In addition, we want to continue to work closely with the Department of Trade and Industry on the research and development of possible mitigation factors. Some of those will take a considerable length of time and will have considerable cost. The problem that the aviation sector has is that we cannot approve things until they have been demonstrated to work. Some of the technology solutions that have been proposed so far are too immature for the CAA to be able to approve or to say that they will act as a mitigation on, for example, radar.

We need to consider future aviation policy to see how developments in aviation might allow us to provide more realistic mitigations for the service providers to handle interference and other effects of wind farm development. We sit in the middle, and we see ourselves in a broker role. At the same time, our safety regulation group has to be able to give safety approval to services, taking into account the effects of wind farms.

Allan Baillie: As I said earlier, the Ministry of Defence treats each case on an individual basis and we work with developers to try to find solutions. Because of the numbers, we have put in more resources to try to reduce the time taken. We have been holding workshops and seminars with developers and environmental consultants so that they understand our issues and can take them on board at a far earlier stage. We are considering what additional mapping we could do, and that may well inform the process. In addition, we work closely with the British Wind Energy Association and the DTI. We seek to work closely with the Scottish Executive by means of a concordat to regulate how we work closely together. A team has gone around to meet the regional authorities; we are keen to get involved when they build their strategies so that we can let them understand our concerns and smooth the path as much as we can.

As you mentioned, we have also been involved in research, as opposed to funding it. QinetiQ, which you will appreciate is now an entity in its own right away from the Ministry of Defence, is using its expertise, but the Defence Diversification Agency, which is part of the MOD, is also involved in examining some of the technologies.

Air Commodore Bryant: From our perspective, we are examining the processes rather than the technologies. The means of reducing the limitations that are imposed have already undergone a fair amount of consideration. Only the tactical training areas for low flying give us cause for concern. Purely from a flying perspective, the vast majority of areas in the UK low-flying system, in which people do not fly at less than 250ft, have already been taken out of that equation. That has already opened up wide opportunities.

David Hilton: NATS is approaching the issue with the power generators on four fronts.

Especially for some large applications in the Glasgow and Edinburgh areas, we are considering a new tracking system that has been developed by an air traffic management systems provider. As Andy Knill said, that system is still unfortunately very much at an R and D stage, so there would be an element of risk in our withdrawing objections at this time based on an unproven product. It is not as if we can buy such systems off the shelf.

However, we have agreed that we will implement the system in an operational trial in parallel with our existing systems. Our primary concern is obviously safety, but what causes a problem for the power generators is the time that such trials take before we can allow their developments to go ahead and before we have sufficient knowledge about whether the new product will work to allow us to withdraw our objections.

One systems area that we are considering is potentially building a new radar site in the Scottish lowlands to fill in areas that, due to proposed wind farm developments, would be blanked off on existing radars. The proposal is still at an early stage, but we have some concerns about whether it is feasible, in that the new radar site could reduce our coverage at lower levels in some areas. Another systems area under consideration, for which we have done extensive flight trials for three or four applications in the Glasgow and Edinburgh areas, is the possibility of using existing filtering techniques to model how many turbines we could eradicate from our radar displays without losing any of the radar's performance in terms of aircraft detection.

We have also just started to revisit applications from power generators to consider allowing proposals to go through on a phased basis. The power generator would be asked to build first only those turbines that would not be in the line of sight and so would not be seen by the radar. In some cases, we would also discuss whether the height of turbines could be reduced to achieve the same purpose of being removed from the line of sight. Unfortunately, that also reduces the viability of many of the power generators' projects because it reduces the amount of power that would be generated. However, we are working on that.

Finally, as Andy Knill mentioned, we and the CAA are considering future developments in the air traffic world, such as the mandatory carriage of transponders in aircraft. That is some years away yet, but we fully support the CAA on that ideal, as it would reduce the need for primary radars—potentially in the areas where there are most problems with wind farms. We are also considering jointly with the CAA the possibility of changing the rules for certain types of airspace. That would reduce our need to make aircraft aware of the potential returns from wind farms that would be displayed on our radar.

Christine May: I have been unable to think of a way of asking this question that will not provoke a predictable answer. Are you doing all that you can, as quickly as you can, to help the Executive achieve its objectives, as you state in your written evidence?

Andy Knill: That is always a difficult question to answer, because people will always say that more could be done. We need to recognise that all of us are driven by resource availability and by priorities. We are all driven by impacts on our sectors, whether in defence, in commercial air traffic or as an independent regulator. Our primary need is to serve aviation requirements.

16:15

It is apposite that we become as involved as possible and—yes—we could probably do more with more resources. However, we have to make do with what we have as efficiently as we can—and do so with the best will to try to resolve the problems.

There has been a fantastic increase in development applications over the past four years. If I recall correctly, the numbers of applications three or four years ago were in the low hundreds per year; the numbers are now almost 1,000 a year. We have to consider those applications and we have to fund our work on them from our own resource pools.

Another difficulty is that, when a developer in the wind-energy industry has made an application for a particular area—an application that may have been objected to—they are not necessarily able to share information with other users. Round an airport, several different applications may come in from several different developers. All those applications may result in objections because they relate to the same problem. That causes our resource problem to get bigger. We could do more, but resources are an issue.

Christine May: Do any of the other witnesses disagree with that?

Allan Baillie: Not at all. Statistics show that multiple applications are going through. I point out that more than 2,000MW of power would be online if the number of wind farms for which we did not raise objections in 2003 were built.

David Hilton: Andy Knill pointed out that resources are not unlimited. I add that, in the air traffic business, expertise can be a resource problem, in that one cannot just go out and buy more expertise off the street. It takes several years for a radar engineer to gain the necessary experience and knowledge to work on and analyse the systems.

Air Commodore Bryant: From a practitioner's perspective, I would say that we have taken a long time to establish our tactical training areas. There is still a job to be done and those areas are the only way to go. Such training cannot be carried out to good effect in a simulator. We have used tactical training areas because of our consideration for the community. We will suffer if there is a reduction in such training areas.

Mike Watson: My first question relates to the exclusion zone: in the NATS paper, it is 30km; in the MOD paper, it is 74km. I ask both organisations why there should be that difference.

David Hilton: The 30km in the NATS paper relates directly to current planning requirements. Proposals for areas within 30km of an airport have to be submitted to airport operators. In NATS, we do not think that that is adequate in some circumstances. For airports, we would like the figure to be increased: the distance should be about 45km. Our business also has on-route radars and we would like exclusion zones to be extended to cover any on-route radar site, because the same parameters apply.

Mike Watson: Would Air Commodore Bryant comment on the MOD's position?

Allan Baillie: I will answer. There are two different types of radar: one deals with the safety of aircraft in the corridors that lead to airfields and the other deals with air defence. The latter is more about lower-level surveillance. The view of RAF experts, which I have to respect, is that in the current environment such defence requires a 74km clear distance.

Mike Watson: If it is the view of RAF experts that is important, why did you jump in and take that question rather than let Air Commodore Bryant answer it?

Allan Baillie: I did so because I deal with that particular area with my minister, consulting the RAF and other experts.

Mike Watson: May I ask both the MOD witnesses, or Mr Hilton, to comment on why those distances—notwithstanding the difference between them—are very different from the distances in Germany? I understand that in Germany wind farms are permitted within 10km of airports. Why should the situation be so different in another NATO country?

David Hilton: There are a number of reasons for that; it is not difficult to explain, in that each case has to be considered on its merits. Different airports operate in different ways and they have different approach aids. The environmental factors around airports are different: for example, an airport may be in the vicinity of another airport, which can have an impact on how far the approach extends and so on. A simple example is Glasgow airport, where I will be general manager until I take up my new post. On our easterly runway approach, when there are more than three aircraft in stream we join aircraft about 25 miles out. You can appreciate that the point at which they turn on to final approach is well outside 30km. If there happened to be a wind farm at about 30km, the alternative to turning the third aircraft on to final approach would be to keep it on hold, thus delaying its approach and extending its time in the air. We cannot consider airports—or countries for that matter—as a whole. We must consider each wind farm application in terms of its potential impact on its environment.

Air Commodore Bryant: I know a little about the practical aspects of air defence. The object of low-level air defence coverage is to fill in any gaps that there might be, whereby we would not have sight for security purposes of the airspace within the UK air-defence reach. The trials that were done on that were run by the director of engineering and interoperability—that is where the figure of 74km comes from. The trials were done by the Royal Signals and Radar Establishment back in February 1995. The net results are that we have some 12 air defence sites around the UK that try to fill all the gaps in coverage to ensure that there is no incursion, and that we can bring to bear the rest of the air-defence network on anybody who intrudes in UK airspace and about whose intentions we are uncertain. The 74km figure feeds in to that pattern, which is a different process from looking at aircraft in an air-traffic control zone.

Mike Watson: I can understand that, but I am rather surprised that NATO countries would have such significantly different limits. Although I understand that there can be no standard on this, and that the UK certainly has many facets that make it different from mainland Europe, it seems to me that the operation of wind farms in terms of interfering with radar must have the same effect wherever they are. I am not an expert on radar but, assuming that the pylons are the same height, can the effect on radar vary? I understand that buses, cars and other traffic—even flying kites—can show up on radar. How do you deal with that? My understanding also is that anything on a radar screen shows up as an X. That is a rather unsophisticated analysis—perhaps you could give me some greater detail on that.

David Hilton: As I said in our submission, we have several ways of filtering out traffic on the motorway and so on. Unfortunately, the nature of a wind farm turbine is that it moves at a similar speed to an aircraft, so filters that filter out road traffic and non-moving obstacles such as buildings cannot be used to filter out turbines.

In answer to the second question, I will cite an example. I have recently removed our objection to a wind farm site 2.5km from Glasgow airport purely because it is in a position where, although it will show on radar, it is within the aerodrome traffic zone, where aircraft are either working visually or on the instrument landing system. That turbine will not interfere with either.

Mike Watson: I have a couple of questions for Mr Knill of the CAA. You mentioned in your

submission two concerns, one of which was physical obstruction and one of which was

"Communications, Navigation and Surveillance … Facilities."

Could you give the committee some idea of the split between those two when the CAA feels obliged to lodge objections to wind farm applications?

Andy Knill: To date, the CAA has not filed any objections, because the pre-notification of any development goes to the service provider or to the aerodrome operator and is for them to assess. We are concerned about the cumulative effect throughout the UK. Odd wind farm developments in themselves might not cause a problem to the whole airspace structure and its supporting surveillance facilities, navigation aid coverage and so on, but a large proliferation of developments could cause a major problem, at which stage the CAA might have to consider objecting. We monitor overall development throughout the UK carefully.

First, on physical obstruction, each aerodrome operator is responsible for safeguarding the area around its airport. The operator lodges plans with the local planning authorities that show areas within which it must be notified of any physical development. If the height of a proposed development penetrates the surfaces around the aerodrome—which are inclined to allow for the approach paths in and out of the airport—the operator will raise an objection in order to ensure that there is no physical intrusion into the paths of aircraft coming into and going from the airport.

Secondly, aerodromes and on-route service providers have radar and navigation facilities. We examine whether a wind farm causes interference on radar—which David Hilton has discussed from the NATS perspective—or whether it can affect the propagation envelope of a navigation aid; that is, the signal pattern that is radiated for the use of aircraft that are navigating on the on-route structure.

At this stage, most work is concentrated on the radar, but with the DTI we have started to commission extra work to examine the effect on navigation aids, not because to date we have identified a major problem, but because it is important for the CAA and our service providers that we understand what effects there may be so that we can advise wind farm developers and the DTI if there are additional issues. That work may also help us with the guidance that we can give, because it may enable us to identify ranges from such facilities within which we would not want to see a development because of the effect it would have on navigation aids.

Mike Watson: In terms of your approach to potential wind farms, which of the two categories would be more problematic?

Andy Knill: They would both be problematic. The service provider at the aerodrome has to be able to ensure that its operation is safe. That has to be documented under its safety management system, and it has to be able to put in place measures that would mitigate the effects of any developments in the area, such that our safety regulation group, which gives approval for the aerodrome operation, is satisfied that it is safe and that the air-traffic service provider has taken all issues into account.

That is the physical side; the same rules apply to communications, navigation and surveillance. We need to be able to satisfy ourselves that the service provider can still operate safely. That does not mean that there cannot be a development within 30km—it does not mean that there can be no agreement to developments wherever—but the service provider has to be able to demonstrate that it can still satisfy the legal safety requirements on the service that it provides. For us, they are equally important.

Mike Watson: I have one final point on your submission. It refers to the safeguarding policy, which seems to apply only to physical obstructions. Is there a similar policy in respect of communications, navigation and surveillance facilities?

Andy Knill: Technical safeguarding is a similar process. Physical safeguarding is more clearly defined because—as David Hilton said from the NATS perspective—it is possible in physical safeguarding to define clearly a geographical radius around an aerodrome. CNS facilities can experience interference or be affected at much greater ranges because of the effect on the airspace structure above where the interference is caused. Therefore, technical issues tend to be dealt with more on a case-by-case basis. However, a similar process exists. We keep an eye on all developments and we determine how they would impact on all CNS facilities throughout the UK. We do that in conjunction with on-route service providers, such as NATS, and with individual aerodromes.

Mike Watson asked about planning and overseas territories. It is worth bearing it in mind that airspace structures in other states are slightly different to that in the UK. Countries tend to have different ways of designating airspace and the requirements within it. In Europe, we are working under the single European sky project to change that situation and to create a common airspace structure.

We believe that, under the planning rules in Germany, if no justified objection is raised to a wind farm development it will go ahead. However, if it is subsequently found that the development causes a problem for an air-traffic service provider

at an airport, the developer is required to remove the wind farm. We understand that that has happened in Germany in the past couple of years. Germany has slightly different planning rules that allow such processes to take place. There is both an airspace structure issue and a planning rules difference.

16:30

Mike Watson: I have a question that is inspired by that point for either Mr Baillie or Air Commodore Bryant. Are any RAF planes based at air bases in Germany at present?

Air Commodore Bryant: No, there is none based there permanently. We have come back from Germany.

To chip in on the earlier question, despite the fact that we, Germany and others are all members of NATO, we do not do things in quite the same manner. NATO has baselines, but we like to aim a little bit higher than the baselines.

Rob Gibson (Highlands and Islands) (SNP): I represent the Highlands and Islands, an area that is far bigger than Belgium and which contains a major low-flying area in the centre that must be entered and exited. As well as the low-flying area being an inhibitor to renewable development, all the areas of access and egress are also inhibitors. There are also the Tain and Cape Wrath bombing ranges and so on. A lot of people set store by the fact that our area has the best potential in Europe for renewable energy in wind, wave and tidal power. My questions are set against that background.

Mr Baillie said that he did not come with any statistics in respect of the MOD estates. It would be helpful if he would provide the committee with a list of places where objections have been made to wind farms before, during and after the planning stage in the Highlands and Islands and, by extension, throughout the rest of Scotland.

Allan Baillie: We will be happy to provide that information.

Rob Gibson: Thank you.

I live in an area in which a wind farm has operated for more than five years. However, a proposed extension cannot take place on the ridge at Novar because it would enter the low-flying training area. That is stated on the planning application, which is before Highland Council at present. Have you made any efforts to accommodate existing developments that would be made more economic by being extended?

Allan Baillie: Low-flying areas are not no-go areas for wind farms. Indeed, we have approved applications for developments in some of those areas. The extension of an existing development falls within the same category. We would have to work with the developer to see whether there were issues and how we could get round them. Proliferation is of particular concern. Although we might be able to approve one, two or more masts in some locations by finding a solution to our concerns, extensions can take us to the point at which that is no longer a viable option, which is why we consider all applications individually and on their merits. We seek to ensure that we give a full explanation to the developer about what we can and cannot do, and why.

Rob Gibson: The fact that the extension would be in the main line of access to the Tain bombing range would, of course, have a major effect. Nevertheless, an area that has already been somewhat developed has to take avoiding action by having the towers lower down the hill, which is an effect that the MOD has had on economic development in the Highlands and Islands. Can you quantify the effect that rejection of wind farm applications in the Highlands and Islands has had on the development of that important modern renewable energy?

Allan Baillie: It is important to make the point that we object only when there are safety matters that would affect our operations or when we can prove that there is a case to be made that there would be degradation of defence capabilities as a result of a proposal. That is the balance that we take into account in how we approach the developers and in how we seek to find solutions. If we cannot find a solution, we just have to be honest and say so. If a point is reached at which a proposal needs to go forward, that is probably when it becomes a decision for my minister to make in the balance of UK interests.

Rob Gibson: I would like to extend this line of questioning to offshore developments. We are now involved in the development of wave and tidal power, which will obviously have effects on sea lanes and on areas where submarines and ships go to exercise offshore, in what are perhaps some of the best operational areas for wave power. You say that you are currently only at the review stage of the process by which the MOD will assess how it will respond to the development of commercial wave and tidal power. If any of you have an interest in that, can you say a bit about it?

Allan Baillie: We will clearly have an interest if a development is proposed in an area in which we currently operate, whether it is our Navy that operates there or another. Again, the same principles apply as are applied onshore. We would need to understand the proposal and how we could work to achieve it. That could mean changes in some of our operational patterns, but if we could not do it that way we might have to find some

other way or, ultimately and regrettably, we might have to stand up and say that we could not change.

Rob Gibson: Basically, what we are positing is a direct clash in some areas between UK defence interests and the development of the best potential renewable energy areas that we have in a country where there are not large numbers of economic options.

Allan Baillie: I like to think that we would find a solution before that was the case, but ultimately I have to agree that that could be the case.

Rob Gibson: How soon will we have the guidelines for the offshore area that I have just been talking about?

Allan Baillie: As I said, the guidelines are exactly the same as those that we operate onshore. We will operate with the DTI and other bodies, pre-application and pre-consideration, to see what we can do to mitigate our concerns effectively before matters progress.

Brian Adam: We have a map before us that shows the two designated low-flying areas. Is it fair to say that there are other areas, including the ones to which Mr Gibson referred, in which there is also regular low flying? Is such flying associated with the various bombing ranges, for example? Would it be possible for us to get maps of all the areas where you might wish to examine applications, beyond the two designated low-flying areas that are shown on this map?

Allan Baillie: The two designated areas are the principal areas in which low flying occurs. There are some areas round about the bombing ranges for which we could provide mapping.

Brian Adam: Your concerns would, I presume, be as relevant to those areas as to the low-flying areas.

Allan Baillie: Indeed. There are effects wherever we do low flying outwith the main transit routes. In some recent cases, we have found that the air defence radar gives rise to more concern in terms of location than does the low flying in some of the locations next to the coastal bombing ranges that you mentioned.

Brian Adam: The implication—as far as I am concerned—is that it is just the pink areas and the green areas on the map that you provided that you had specific concerns about. Would it be fair to say that there is a considerably larger area of Scotland in relation to which you would want to be consulted in detail on any applications?

Allan Baillie: We are consulted on all proposals that are made in the UK. Our concerns rest principally on the two low-flying areas, but the fact that we are consulted on all proposals, through the process that we have set up with the wind energy industry, allows us to ensure that if concerns arise in relation to safeguarding other defence establishments, we can make them known. Our concerns are not only about the low-flying areas, but the low-flying areas do give rise to particular concern.

Brian Adam: Is there a differential rate at which you reject proposals at the pre-application stage between the low-flying areas and the other areas about which you are consulted?

Allan Baillie: As I said, I do not have statistics that are split in that way. I can only return to what I said earlier; we deal with each case on its merits, and the areas of particular concern are the low-flying areas. Clearly, it is easier to give a technical assurance that development outwith those areas will not be as problematic.

Air Commodore Bryant: I can give an example. An 80m diameter wind turbine, which takes the blades up to 300ft, would impact on someone in the low-flying system, but would not impact on the technical training areas, although in those areas flying can be as low as 100ft for short periods in special circumstances. Within the rest of the low-flying system, which is from 250ft up to 2,000ft, something at 300ft would have an impact. A single impact at a point in the area, all other things being considered, would not be a big issue. Low-flying traffic could be routed around it and still achieve its mission. There would be a concern if a large wind farm was put up in the middle of a choke point, where we try to fly between two towns because we do not want to fly over a population. If that gap is closed, the traffic has to move elsewhere. Would that create a problem in the area to which the traffic would be diverted? Would we start to concentrate traffic elsewhere? That is a consideration on which we would take a view, although that is not to say that there would be an objection. That is an example of a circumstance that falls outside the straightforward technical training areas.

Brian Adam: My question was prompted by an application that exists for a sizeable wind farm near the former aerodrome at Boyndie in Banffshire. I am aware that low flying takes place in that part of Aberdeenshire, although perhaps not down to 100ft—or, at least, it is not meant to go down to 100ft.

There are concerns about the implications for radar, but the towers are static and, presumably, you are trying to identify things that are moving rather than just going round and round. Why is there a technical problem with differentiating between them, unless you might think that there is an invasion of hostile hovering helicopters?

The Convener: I suspect that we might not like the technicality of the answer.

16:45

Air Commodore Bryant: Brian Adam is absolutely right. If we were looking at a shipping radar, which is a straightforward paint of the world around us, we would know that the turbine was static. However, the turbine modulations that come off the large propellers can force a radar to think that it has found a moving target. Even if the radar is meant to detect aircraft and other moving objects, the velocity that is put on the returns that encounter the propeller means that they are bounced back by something that appears to be moving at speed. Because the propeller is turning, the radar gets a return from that bearing with a velocity that can cause confusion.

Brian Adam: Given that the location of the turbines and the speed at which they turn will be known, and given that most facilities will have an idea of what the wind speeds are in the various areas, is there no prospect of a technical solution to what seems to be an unreasonable technical planning blight? For a layman such as myself, that seems difficult to understand.

David Hilton: Existing radars have what we call the ability to black-spot areas, which are known by the technical term "non-initiation areas". By inputting the latitude and longitude of a wind turbine, we can tell the radar software not to generate a return for any hits in that area. However, we would not use that method in a large area. Although it might be suitable to black-spot a single turbine or the M8 changeover so that we can get rid of a lorry that is sitting on top of the M8, that does not work for wind farms that might have upwards of 40 turbines. The proposed development at Whitelee would have 140 turbines. Blanking out such a huge area would get rid of returns not only from the turbines but potentially from aircraft as well. Obviously, there are safety considerations.

Chris Ballance: The MOD submission says that you handle applications on a case-by-case basis, but that is not what happens in practice, given that you also say that you have called for a moratorium on all developments within a radius of 30km around Eskdalemuir. That is not a case-by-case approach but a blanket ban. Press reports suggest that the area to which the proposed ban would apply has changed in size. Having gone up and down, the limit is now at 30km and it has moved a fair bit. The ban would place a moratorium on a fair percentage of the best sites for wind development in southern Scotland, when one takes into account wind speed, height and access to the 400kV grid. That is a large obstruction.

Developers are told one moment that the MOD will raise no objections and the next moment that it will. One or two developers have reported to me that they receive changing wisdom from you. Developers feel that the MOD's attitude is obstructive. Why cannot a map be produced for developers to show them where there might be a problem, where there definitely will not be a problem and where there definitely will be a problem?

Allan Baillie: We have considered on several occasions whether such a map might be produced, but we felt that it was genuinely not feasible as it would not give the best information. We would end up with amber and red areas across the country and not many green areas, especially in the parts of the country that we are talking about. That is not to say that we have given up on the idea. We are reconsidering whether, as terrain mapping improves, we might be able to find a better way of representing the issues.

A new reason for objecting to the development near Eskdalemuir hit us just before Christmas, when we began to realise within the department that the noise that the turbine blades would generate would affect the Eskdalemuir station. That is why we reacted by asking for an 80km area, which has now been reduced to 30km. We have done a lot of work with the British Wind Energy Association and the industry in general to try to find a solution that will take that forward.

For the moment, the limit is 30km. Although the restricted area impinges outside to a small extent, that 30km is, by and large, contained within the low-flying area. We are still taking a case-by-case approach. We will lodge an objection on those grounds but, nevertheless, we will work with developers to find a way forward.

There is on-going work to try to resolve the technical issue over whether there is a case for maintaining a ban for Eskdalemuir. Work is on-going with Keele University, which did some of the original work on the Cornwall study. We hope that by September we will have a positive way forward. Either we will have a way of protecting our interests—which is not necessarily a ban—or we will know that we do not have the problem that we perceive we have.

Chris Ballance: To use a traffic-light analogy, if your position is that there are no green areas in Scotland—that is, areas within which you would not have problems with wind farms—it might be more honest if you came out and said that, rather than hiding behind addressing matters on a case-by-case basis.

I ask you to focus on Eskdalemuir. Surely once a wind farm is up, any low-level, low-frequency noise that it generates will more or less be fixed in relation to the wind speed. It surprises many people that you cannot tell the difference between a nuclear bomb going off somewhere in the world and an increase in wind speed from 20mph to

30mph at Eskdalemuir. Surely there will be a method of calibrating your equipment so that it can tell what is normal, given the wind speed, and what is a bomb going off.

Allan Baillie: I share your hope that we can find that method. That is exactly what we are trying to do. The work that is going on seeks to determine whether the problem is of the size that we believe it could be, and what we can do to mitigate it.

Chris Ballance: I will take that as an answer.

I will expand my area of questioning to pick up what Rob Gibson said about wave and tidal power. Paragraph 11 of your submission is all very encouraging. It says:

"these methods of producing renewable energy are unlikely to cause MOD major problems".

That is much like how you say you support wind energy development. You then go on to qualify that by saying that such developments might cause you major problems if they were in positions that

"would interfere with military exercise areas or would be damaged by the testing of military equipment"

or if they were in range danger areas.

A large amount of the coast and a large area of the sea are occasionally used by the Royal Navy for military exercises. Are you in a position to produce a map of the coastal areas around Britain—and around Scotland in particular for this inquiry—that shows areas where you would object to any marine development?

Allan Baillie: I will take that under advisement and write to you with an answer, because I do not have an answer at this time. However, what we say in our submission is surely only sensible. We do not know what proposals will be made. Our position is that we will work with people to try to find mitigations that will allow the proposals to proceed. We are only protecting what we started out with, which is the activities for which the Ministry of Defence exists, in terms of defending the realm and looking after the safe operation of our service people while they are training to do that.

Chris Ballance: That letter would be useful because, if I can use a Winnie-the-Pooh analogy, you seem to be saying that Tiggers like all renewable energy developments except when they are proposed here, here or here. All of a sudden, we find a new objection to every proposed development. It would be useful for the development of marine technologies if we knew what the parameters were. There is no point in spending a large amount of money on surveying the coast to discover where the best places are to put marine technology if the MOD comes along the next day and says, "You can't have this or that; Tiggers don't like this or that."

Allan Baillie: I challenge that point to an extent. We are trying to get on board at the early stages so that, for example, when the coast is being surveyed for such opportunities, we are in dialogue with those who are considering the proposals so that we understand the issues and relate our issues to them. I hope that we do not come along as tail-end Charlie. I was asked earlier what we seek to do proactively. One action that we are taking is to get involved with regional and local authorities and developers to try to ensure that we understand the issues and to help them to achieve their aims.

Chris Ballance: Some developers would find it helpful were you to come on board even earlier and say from the outset where you think the problem areas are. That would avoid unnecessary waste.

Allan Baillie: There are two sides to that coin. We feel that we are doing as much as we can to help developers and we would like to do more, but we do not always get the same story from both sides.

The Convener: I stress the importance of Chris Ballance's point. There is a feeling that Scotland has missed some of the spin-off economic benefits of onshore wind energy and that wave and tidal power might well provide significant economic opportunities. We would not like those opportunities to be stymied.

I have a question that is based on a layman's point of view that has been put to me. Your evidence mentions that, in the tactical low-flying areas,

"avoiding a proliferation of obstacles would negate the value of the training."

Although we do not want to make it dangerous for pilots who are in the tactical area, why would a proliferation of obstacles negate the value of the training? Surely, pilots in combat situations would not have a guarantee that the enemy had not built wind farms for whatever reason. I take the point that was made earlier that flights might have to go over either a town or a wind farm because there would be nowhere else to go, but leaving that to one side, why would obstacles negate the value of the training?

Air Commodore Bryant: The crux of the issue is that the tactical training areas are quite small. They may not seem small when one is in a car, but they do when one is in an aircraft flying around at 450mph—it takes only a few minutes to get from one side to the other. If we closed off areas within those small areas, that would channel the traffic. The area is supposed to be unique and highly flexible. The only people who use it are those who are training to release weapons. A scenario might be set up whereby they are

challenged by an air defence force. At that point, they would need flexibility to vary their route in the area, not just to go from A to B down a route that they know is clear of wind farms.

To fly at 100ft is an incredibly demanding skill. The training areas are used to practise for the real event. When we go on operations, there is a greater level of risk and we are happier—if one is ever happy about such things—for there to be mishaps. Mishaps are an occupational hazard, but we try to breed them out during training.

The Convener: Do you object to electricity transmission lines or pylons, some of which are getting quite high?

Air Commodore Bryant: I will have to take advice on that. I am not an expert on that because we tend to fly above 250ft. I suspect that the answer is that relatively few pylons go through the areas, but I will get back to the committee on that point.

The Convener: My final point is on the 74km radius from the air defence radar. Your submission states:

"This policy was borne out of the tighter security employed since September 11 2001."

Does that mean that prior to that you were prepared to put up with a level of interference to the radar that you were not prepared to put up with after that date, because of the level of the threat?

17:00

Air Commodore Bryant: The mentality used to be quite different. A little more than a decade ago, the threat to the UK air defence region, which is what we are talking about, was largely seen to be external. We were looking out for historically unfriendly forces. Nowadays, the nature of the threat is far less predictable and we might not know where it is coming from, so we do not have the luxury of being able to track potentially threatening aircraft all the way from the Kola peninsula around Norway, for example.

The Convener: We have finished our questioning. I thank you very much for your evidence, which has been useful.

I move quickly on to the next panel, which is the Scottish Energy Environment Foundation. Our witnesses are Chris Bronsdon, who is the director, and Dr Gary Connor, whose position is not specified in my briefing notes.

We have talked to your organisation before so we do not need to ask you what you do. We also have your latest paper. We are obviously taking a lot of evidence and we are trying to get as many reflections on that evidence as possible before we talk to the minister in the near future.

Paragraph 3 of the summary in your submission states:

"Scotland's aspirational 40% renewables target has been analysed by using an independently verified computer model, and is deemed as being likely to be met."

That is the most optimistic statement that I have read for some time. Will you expand on that to start with?

Chris Bronsdon (Scottish Energy Environment Foundation): Certainly. In order to model the position in the future, we have to make certain assumptions. Part of the remit of this inquiry is to examine what is required to bring on renewables. The current system for Scotland operates under the wider UK framework. On that basis, we have considered how different technologies will compete under existing conditions, but we must bear in mind that those conditions might not carry through to the future. For example, there might be changes to planning and support mechanisms or there might be a change of Government. We have assumed that a certain number of conditions would be steady and then, on a competitive market basis, projected what would be delivered. On that basis, the target for Scotland could be met, but that statement is crystal-ball gazing, to a degree.

Dr Gary Connor (Scottish Energy Environment Foundation): Scotland makes up 10 per cent of the UK electricity demand. Given that we have the better resource and a more favourable planning system, the UK renewables obligation for 15.4 per cent of electricity from renewables by 2015 will create pressure in England and Wales to site in Scotland. Therefore, it is likely that large capacities of wind power will be forced to come north, which will make up the 40 per cent target.

The Convener: I will not embarrass you by asking you what political changes you factored into the model.

In the next paragraph of your paper you say:

"Up to 90% of the renewable capacity built under the existing …"

renewables obligations

"will be wind, mainly onshore."

How much of the 40 per cent renewables target will be met by wind?

Dr Connor: That statement refers directly to the 40 per cent target, not in the UK but in Scotland specifically. Given what market conditions are likely to produce in a Scottish context under existing policy—no policy change is planned at present—we forecast that rational investors would invest in 90 per cent wind power capacity up to 2020.

The Convener: Translate that into wind farms or pylons under the latest technology.

Chris Bronsdon: Table 1 in our submission lists megawatt capacities.

Richard Baker: I was interested in the column in table 1 on estimated full-time equivalent jobs. Overall, your figures for jobs created seem more pessimistic than the ones that we have seen. I am concerned about what was said about there being 72 jobs generated in the marine energy sector. Presumably that refers to what will happen if we do not invest in marine energy in the ways that you suggest later in the paper.

Chris Bronsdon: I am aware that you are referring to the UK gap analysis that has provided expected figures for Scotland. Our figures are slightly more optimistic to a degree, but our model has considered a slightly larger capacity of technologies being delivered in Scotland than the gap analysis allowed for. It is important to note that Oxford Economic Research Associates carried out a piece of work for the renewables innovation review that was published a couple of weeks ago that considered a similar position and validated to a degree the scenario that we produced on the predicted megawatt output.

Our view is that there are real job opportunities for Scotland, but given the existing scenario it is unlikely that the market will deliver a significant capacity in Scotland. That is not to say that there are not great opportunities for marine technology in Europe and worldwide. However, we need to show that the technology can work in Scotland first, which requires support for employment and skills.

Richard Baker: So on the whole there is more potential for jobs than what you outline in the table. I read with interest what your submission said about more incentives through renewables obligations for marine energy. You also talked about research, design and demonstration funding. Do you see that funding as primarily more DTI and Executive funding, on top of funding for the schemes that we have seen already, funding for academic research, or a combination of the two? Will you expand on that?

Chris Bronsdon: Sure. The position is that to get any technology into the market takes not only the skills base and research infrastructure but the market pull and the demonstration opportunities to prove that the technology does what it says it does and that it is economic and presents a low risk. When all those things are set up, the right environment is created for a really vibrant industry and a skills base to tie in and get investment.

The electricity market in the UK is driven by the regulator, which says, "We are happy to see anything move forward as long as it is at least cost to the consumer." As a result, the cheapest technologies are generally chosen. As Richard Baker rightly said, emerging technologies might require further support to make them viable and provide real benefits. The position that needs to be taken—I am not sure that we can qualify this—is that it may be more applicable to provide research funding and demonstration funding through a different mechanism than to place additional costs in the market where the regulator is saying, "We want the least-cost technology." All we really want to alert you to is the fact that there are a number of options and mechanisms that can be explored, even with reference to what other countries have done, but you need to consider carefully whether you are trying to achieve more technology by supporting it through the market or by funding it at a higher level through other funding streams.

Christine May: In paragraph 7 of your submission, you consider the less-developed technologies and refer briefly to biomass and marine technologies. Although you go on to talk about marine technology, you do not say anything more about biomass. Will you comment on that?

Chris Bronsdon: One of our roles is to act for the research councils in the United Kingdom through managing one of the Engineering and Physical Sciences Research Council's research programmes on sustainable power generation for wave and tidal technologies. We took the information on marine technology from an area with which we are particularly familiar, but we could equally produce the figures for biomass. I do not know whether my colleague would like to add anything on that, but if you would like further evidence, we are more than happy to provide it as a written response.

Dr Connor: Perhaps we concentrated on marine technology simply because the export market and the potential for manufacturing and employment are probably greater than those for biomass. Finland, for example, already has a developed market for biomass. That is not to say that biomass is not applicable to Scotland meeting the 40 per cent target; we believe that it is.

Christine May: In your previous answer, you spoke about the regulator seeking least cost to the consumer. Is there an argument for suggesting to Westminster that that aspect of the regulator's function be reconsidered and modified slightly?

Chris Bronsdon: If we are to move forward, we need to identify what we want to achieve. Scotland is taking a great step with its aspirational 40 per cent target and people's willingness to consider the issues. The committee's inquiry focuses on renewables, but the topic of renewables goes wider than the technology: it involves the skill base, social benefits, economic growth and the fact, which we must not forget, that we are working

to a longer-term United Kingdom target of a 60 per cent reduction in CO_2 emissions by 2050. Without the proper analytical approach, we cannot make strategic decisions about where our efforts would be best placed. We endorse such an approach being advanced in tandem with the UK Government, because Scotland is working within the framework of the UK. It would be great to see Scotland leading the UK and encouraging the DTI to adopt a supportive approach.

Christine May: I think that that might have been a yes.

Chris Ballance: I too will ask a bit more about paragraph 7 of your submission. We have heard on various occasions that it seems as though Scotland and Portugal are leading the world in wave and other marine technologies and that Portugal has the leading edge in developing those technologies. However, nobody has actually outlined to us what Portugal is doing to gain that lead. Do you have an analysis of that?

Chris Bronsdon: We can provide a quick response.

Dr Connor: To put it simply, Portugal has put in place a feed-in tariff for the first 20MW of wave or other marine energy. That tariff is set at €225 per MWH, compared to the £60 per MWH that we get from the ROC market at the moment. You can see the differential. A marine energy developer would look at our £60 against whatever the €225 would be in pounds. The tariff is complex and varies over time; it consists of about three pages of formula. I will not go into it now, but I would be happy to furnish you with that information, if it would help.

Chris Ballance: We can pass over the detail.

Chris Bronsdon: As previous witnesses have said, given our resources, we have a real opportunity in Scotland, but if we are not careful, we could lose the technology to another country that has a better market condition. That is one of the areas of work that needs to be explored further. If we are going to support emerging technologies better, how can we do it to ensure that the research base is supported, that the industry gets the right signals to invest in a home market and that we can export, too?

17:15

Chris Ballance: Is the tariff, or ROC, system more important than the research and development element? If you wanted to use one mechanism to stimulate the industry, which would you prefer to use? I realise that that is a difficult question, but the committee has to make a decision about where the balance should rest when it makes its recommendations. I am interested in where you would strike the balance.

Dr Connor: The ROC system is extremely important for mature and market-ready technologies. Its great benefit is that investors can operate within the market with some certainty that there will be a ROC price over a certain period. In the Portuguese system, one is guaranteed a certain price over a certain number of years; however, that would not be the case in the ROC market. The Portuguese system is therefore far preferable for new and developing technologies that are only just making a profit.

The issue of research and development moneys is slightly separate, as initial investment is required in the learning rates to bring the technology to the point at which it can be profitable in the ROC market. As a result, both mechanisms will be needed.

Brian Adam: Members have asked you questions about paragraph 7 of your submission. However, in paragraph 8, you ask yourselves some questions. Would making some short-term sacrifices over renewable goals and the first stage of reducing carbon consumption have long-term, sustainable economic benefits? It appears that the dash for wind is replacing the dash for gas. I do not know whether that is in the public's long-term interest, but we might have to make some short-term sacrifices if we are to achieve those goals. Can you quantify those sacrifices? Is such a priority more important in the long term if we want a sustainable industry?

Chris Bronsdon: If we are considering a move towards a more sustainable generation mix for Scotland and the UK, we will need to examine the trade-offs involving energy, the environment and the economy and will need to demonstrate transparently, through rigorous analysis, why we have chosen a particular policy direction in future. At the moment, I do not believe that we have completely brought that together in Scotland. Although we commend major steps such as the establishment of the forum for renewable energy development in Scotland—FREDS—and the opening of the first wave and tidal test centre in Orkney, and although we are aware that a lot of people are very keen to support such developments, we need to bring all that work into some strategic focus that allows us to start answering questions from an analytical perspective. The outputs of such a decision would provide the committee with what we believe would be the best option for Scotland. Although we have carried out a simple analysis, I would not say that we have answered all the questions.

Susan Deacon: I have a brief supplementary on that response, which touches on the key question that has increasingly come to my mind during this inquiry. You referred to building on the steps that have been taken and bringing things together to

provide a strategic focus—although I would probably use words such as "momentum" or "pace" in that context. I want to edge on a little further. As an organisation and as individuals, you are very close to much of the work on and many of the discussions about this subject. How would you want the issues to come together to ensure that a year from now we are not still talking about all the questions that ought to be asked and all the things that ought to be done but have tried to make progress at an appropriate rate?

Chris Bronsdon: You are asking how we bring together as a single issue a number of the areas that have been quite rightly developed, to ensure that the committee approaches the matter with a common understanding. Those areas have to be linked up.

When the inquiry was established, I asked about the number of members of this committee who also sit on the Environment and Rural Development Committee. The longer-term strategic picture means considering global emissions and what will provide the best opportunity for CO_2 reduction. Going back to Brian Adam's question, if we sacrifice something in the short term, we must be sure what that would achieve in the longer term. Several groups could be brought together to facilitate joining that up, but additional support would be required to provide an independence of view. I cannot state specifically at present what we would recommend for the future.

Susan Deacon: So you do not think that a body such as FREDS will get us there by bringing the key players together in the same room.

Chris Bronsdon: We believe that the FREDS is a good start, along with the establishment of the intermediary technology institute for energy, which is considering the opportunities for the commercialising of research. We are starting to coalesce good signals into a strong body of individuals who understand the market position and the investment required by industry. We must further analyse what policy options there could be for Scotland and what their impacts would be. We would then take that back to the research community and say, "We now have a number of options that we can chose, each of which has an associated impact. How can we use the expertise we have in industry and academia to get us there?" We need to be sure that ultimately we can deliver.

The Convener: I have a couple of final, quick questions. I asked you a question about translating wind energy into the number of wind farms or pylons because people tend to ask that question and it is what concentrates objectors' minds. However, when I looked at table 1 in your written submission, to which you referred me, I found that it refers to megawatt capacity. Is that the theoretical capacity or is it the capacity after assuming a particular load factor?

Dr Connor: That is the overall capacity.

The Convener: That would be the capacity if the blades were turning 24 hours a day.

Dr Connor: Correct.

The Convener: Right. I am with you. So I can divide that capacity by the current most efficient pylon megawattage and get the number of pylons that your megawatt prediction covers.

Dr Connor: Correct.

The Convener: Does the 130MW for large-scale hydro in your table refer to one scheme?

Chris Bronsdon: The way in which the appraisal model works is complex. We can provide that information separately. The model sums up the total number of megawatts and does not indicate whether they are from single or multiple projects.

The Convener: You heard the MOD's evidence. Have you factored its position into your model?

Dr Connor: That can be factored into the model, but I am a little unclear about how we would do so. It is the same with planning and transmission, which involve loss multipliers and other factors that may have a negative impact.

The Convener: You told us that you assumed that there would be a benign planning system. You could hardly describe the MOD as benign—with due respect to the MOD witnesses, if they are still listening.

Chris Bronsdon: In order for the model to stand up, we worked from published data and statistics for planning success and build rates. The information that the model produced accurately reflects the market, which ultimately delivers the investment and the capacity on the ground. We think that the committee should be aware of that. We have a fantastic resource, a willing industry and a good skill base that can be encouraged to expand into the renewables area. However, the market will ultimately deliver the capacity. We must consider whether we can influence policy options and the required discussions or whether we should look outside the market construct for delivery of that.

The Convener: When we have the minister in front of us, is there one killer question that we should ask him? Not that it would be a killer question, because he would have read it in the *Official Report* of this meeting by the time he appeared in front of us.

Chris Bronsdon: That is a good question.

The Convener: You can write to us if you do not want the minister to see the question in the *Official Report*.

Chris Bronsdon: I will pass on the question for the time being. We might provide a considered response in writing.

The Convener: Okay. I thank you for your evidence and I apologise for the lateness of the hour. Your written submission is meaty and will repay further consideration by the committee.

Meeting closed at 17:24.

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