



## UK Engagement with Space Committee

### Uncorrected oral evidence

Monday 31 March 2025

3.40 pm

Watch the meeting

Members present: Lord Clement-Jones (in the Chair); Baroness Bonham-Carter of Yarnbury; Lord Booth-Smith; Baroness Donaghy; Lord Lansley; Baroness Mobarik; Lord Shamash; Lord St John of Bletso; Viscount Stansgate; Baroness Stowell of Beeston.

In the absence of Baroness Ashton of Upholland, Lord Clement-Jones was called to the Chair.

Evidence Session No. 8

Heard in Public

Questions 78 – 87

### Witnesses

I: Joanna Darlington, Chief Communications Officer & Executive Committee Member, Eutelsat OneWeb; Simon Hill, Chief Technology Officer, Excelerate Technology Group; Professor Barry Evans, Professor of Information Systems Engineering, University of Surrey.

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## Examination of witnesses

Joanna Darlington, Simon Hill and Professor Barry Evans.

**Q78 The Chair:** Good afternoon and welcome to this session of the UK Engagement with Space Committee. We are very pleased to have with us this afternoon Joanna Darlington, who is the chief communications officer and executive committee member at Eutelsat OneWeb. We have Simon Hill, who is the chief technology officer at Excelerate Technology Group. Joining us remotely we have Professor Barry Evans, professor of information systems engineering at the University of Surrey. A very warm welcome to you all and thank you for coming in today.

I am afraid that we will probably have votes; it may not be during the course of this session but the next one. If we do have a call for a vote, I will suspend the hearing, and we will all come back within 10 to 15 minutes. We will, I hope, be asking all the questions that we have prepared for you.

I will start off with some fairly general questions. Can you give us a high-level overview of satellite communications? What does satellite connectivity allow us to do that terrestrial telecommunications cannot? I have a few supplementaries but I start with that high-level question. If you could introduce yourself before answering the question, that would be extremely helpful.

**Joanna Darlington:** Thank you very much for having us. It is great to be here, and the context makes it a very interesting and compelling time for satellite communications.

It is probably a good introduction, because, essentially, what satellite does is go to the places where you have no terrestrial infrastructure. That is important economically; basically, you can deliver connectivity via satellite to the millions of spaces on earth where people are in white zones. It can be as basic as television connection. In fact, a lot of us—the legacy players—started out as satellite television providers but now increasingly we do a lot of what we call connectivity applications. That could be for telecoms operators or mobile connectivity, and, of course, government use as well, which would include military applications.

**The Chair:** What is Eutelsat OneWeb's place in all this?

**Joanna Darlington:** Eutelsat is what we call a legacy player in the satellite business; we have been around for about 40 years. We are the third-largest GEO satellite operator. GEO satellites, as you know, are satellites that operate from 36,000 km from the earth. They follow a certain spot around the earth, and they deliver a range of services, including our legacy, satellite television, which is still about half of our business. It is no longer prevalent here in the UK and Europe, but is still very much used in places such as Africa, the Middle East, some Balkan states and Latin America. The other part of what we do is what we call connectivity, which we can go into.

You will probably know that Eutelsat merged with OneWeb at the end of September 2023. The reason we did that was to bring together two businesses which were complementary. The first business was our legacy operations, which is not growing any more but generates a lot of cash flow. By merging with OneWeb, we were able to use that cash flow to support a growing business, which is what we call low-orbit satellite constellation. You will have all heard of Starlink and Elon Musk, which get a lot of media coverage, but OneWeb is the only LEO constellation apart from Starlink that is operating today.

**The Chair:** Thank you very much. Simon, the same question to you.

**Simon Hill:** I am the CTO at Excelebrate Technology. We are an SME, based in south Wales. We pioneered putting broadband, via satellite, on to emergency services vehicles in 2006, and we have been doing that ever since.

The reason we did that was that, when you were responding to any major incident or to a pre-planned event, especially back then, cellular was either not available to be able to communicate or it was highly contended when it was available. If you went to Twickenham and there was no game on, you could use your mobile phone without a problem. However, if you went when there was a game on, and 80,000 people were trying to upload a selfie to Facebook, suddenly the comms is not there. We added satellite communications into our connectivity mix all the way back then, and it has really kicked on since.

Previously we used GEO satellites, but now we also use LEO satellites to get broadband connectivity where there isn't any available. A train derailment in the middle of nowhere would have meant little or no communication. I have just travelled from Cheltenham to Paddington on the train with very intermittent connectivity: satellite communication allows you to guarantee that connectivity, as long as you can see the sky.

**The Chair:** Thank you. Professor Evans, the same question to you.

**Professor Barry Evans:** It is nice to be with you this afternoon. I am from the University of Surrey Institute for Communication Systems, where I head up the satellite activities in our 5G/6G Innovation Centre. I am also chair of UKTIN's Non-Terrestrial Networking Expert Working Group.

The services offered by satellite communications traditionally were in broadcast. Broadcast activities are now reducing quite considerably, although they were the biggest revenue earner for satellite communications. Now, we are focusing more on broadband delivery, backhauling cell sites for mobile operators, and, more recently, the new market of direct to handheld cell phones. Those are the major markets.

Satellite communications provide coverage and resilience. That coverage is into areas where terrestrial systems cannot reach; that is obviously air, maritime activity and remote areas that are uneconomic for mobile

network operators to reach. The resilience—which is taking on more importance now—is around providing, in conjunction with terrestrial systems, a more resilient activity. For example, within the UK's emergency services network, there are 800 sites across the UK which are covered by satellite as well as terrestrial. Satellite provides, essentially, the backup, and in around about 20% of those sites it is entirely satellite, without any terrestrial connection at all. Other users of the system for resilience are all the utilities—water, gas, electricity and so forth—with remote sites which are connected by satellite.

What we are seeing now in the new area—direct to a mobile system—is the provision of a satellite connection which will eliminate the not-spots in the mobile network and enable you to roam back into satellite. It is early days; it is available at the moment for emergency calls and very low data rate calls. By around 2030, we should have a complete 5G connection via satellite providing the coverage anywhere. The two aspects are coverage and resilience, but resilience is particularly important.

**The Chair:** Thank you very much. In a sense, Simon and Barry, you have anticipated some of the supplementary questions I was going to ask about how businesses are using satellite communication services to enhance their productivity, output and opportunities, and the ways in which satellite communications can be leveraged to improve public services. Barry, you spoke to the latter one and Simon to the former. I wonder if you have other examples, perhaps starting with you, Joanna, of either of these.

**Joanna Darlington:** We are a private company and we sell to a wide range of customers. We are a B2B service, not B2C, which is what Starlink is—although it is now moving into the B2B space. We deal very much with Governments and businesses and, within those businesses, telecoms operators.

Barry gave us some examples. It can be anything from connecting a network of banks in a remote area or oil platforms. We do mobile backhauling; we have some big geostationary satellites, which provide consumer broadband; and we have quite a big government application as well, which can go from a service providing internet—what they call troop welfare—to what we call hard graft, which is more military applications.

**The Chair:** Simon, do you want to add to what you said earlier?

**Simon Hill:** We have a whole plethora of different use cases that we have supplied satellite to. The emergency services are our core business: for police, fire and ambulance, being able to guarantee that they will be able to communicate no matter what. It is on their terms; it is not reliant on anything that is terrestrial based. Your traditional command and control vehicle does just that.

We have many other examples, such as a OneWeb connection on a steam train, which is a DSIT-funded project. That is really important, because it needed or wanted to go cashless, and this enabled it to maintain

connectivity to accept card payments along that train route. It relies on donations and, if you cannot donate in cash but you can with card, you need connectivity to do that.

We have customers doing underwater UAS surveys with robotics. They were having to record the video they were generating, take it back to port, use a courier to ship it to a specialist and then decide what they may need to do with it. Now, with satellite, especially LEO satellite, where you have much increased bandwidths and lower latency, they can live-stream it to a specialist, who can tell them what to do and do it there and then. The efficiency has greatly improved.

**The Chair:** Barry, it sounds like your word, resilience, is rather important when we talk about enhancement and improvement.

**Professor Barry Evans:** Absolutely. As I mentioned, it is about coverage and resilience, but coverage has been generally associated with connecting into remote areas and at air and sea, et cetera. But resilience is now becoming, in a way, just as important.

As an example, we have been working recently with Network Rail and the rail system in looking at resilience in communications to railways. You have a situation where the mobile network is quite good but it is not covering perfectly—it is not giving you coverage unilaterally across the UK. You have a system where you have a satellite communication system on board, which automatically switches over when you do not have terrestrial mobile coverage. That is just one example.

Looking to the future, I can see other applications, such as driverless cars, where you will need ultra resilience. That is another example where satellite and terrestrial are complementary. We can provide the resilience by having both together to address the usage.

**Q79 Viscount Stansgate:** In a way, my question has been touched on by all three of you in your answers, but I am going to ask it anyway. Could you give us an overview of what you might call trends in global satellite communications? How is the sector likely to change over the coming years? For example, are LEO or GEO satellites more effective in servicing the global satellite communications market? I have one other supplementary in a moment, but can you just talk us through the broad trends as you see them?

**Joanna Darlington:** The satellite industry globally has undergone a lot of technological change. As we mentioned earlier, satellite was originally started for fairly basic applications, such as television. We did it with what we call wide-beam capacity with geostationary satellites that turned with the earth. One of the biggest evolutions—there have been two—was the development of high throughput capacity for connectivity. That was still with geostationary satellites, but it allowed a lot more flexible and concentrated capacity to be delivered to areas, which then enabled far more effective applications for connectivity.

There were all sorts of changes, and one of them was economic: the use of solar-powered electric satellites rather than fuel-powered, which enhances the business model because it gives them a much longer lifespan.

All this leads us up to, I would say, the past five years, where we have seen a dramatic acceleration in the pace of technology. There are reasons for that. What is interesting with the satellite industry is that, as technology evolves, it creates new use cases. Simon mentioned satellite on trains and connected cars; neither of these things would have been possible five years ago with geostationary satellite. Broadband in aircraft has always been available, but the service has been so terrible that the adoption has been very low.

The real change that has come around is LEO—low orbit constellation satellite. This has been a massive game-changer for the industry. It delivers two things: the first is ubiquity, and the second is much lower latency than a GEO can offer. It develops all sorts of use cases. It is obviously very important for the military to have low latency, but it applies to all sorts of other applications, such as high-frequency trading and electronic computer games; what we historically call video is still 80% of traffic on satellites today.

This has been a real revolution. What has really pushed that revolution is the advent of a player with very deep pockets: Elon Musk, with Starlink. He has invested billions, and we now have a very powerful GEO satellite system which is navigating at low earth. It is about 500 miles from the earth, with all the issues that brings but, nevertheless, we have seen terrific technological advancements. An example is the use of Starlink in Ukraine for the battlefield.

For me, the trend that we see as a business is a decline in demand for traditional satellite capacity, or geocapacity. We are seeing a huge amount of growth in demand for connectivity for data, but all that growth is, in a way, being generated by this new technology, LEO, but it is also being absorbed by LEO. This is the trend we see as one of the largest commercial operators.

**Viscount Stansgate:** Would the other two witnesses like to comment?

**Simon Hill:** In our world, which is predominantly mobility, we have seen a pivot from satellite towards cellular. As cellular got faster and more available, the value of a geostationary satellite connection—which was quite expensive and slow —declined, while cellular was more prevalent and available.

In the last few years, we have seen that pivot back into the centre. When LEO networks such as OneWeb and Starlink came along, it brought satellite back into the domain. Starlink is a household name—you can buy a Starlink terminal from Currys or John Lewis. The notion of using satellite to get your connectivity is much more in the front of everybody's minds, as opposed to years ago, when it was very much a case of, "This

thing called satellite can give you this". People accept it as a method of connectivity.

**Viscount Stansgate:** Do you want to add anything, Professor Evans?

**Professor Barry Evans:** Just to say that I agree. The trends we have seen are from large geostationary satellites where, for a long period of time, there was a market demand of around 25 to 30 per year. Just to note, the UK had quite a bit of that market, largely through Airbus. Now we have LEO constellations, with very large numbers of satellites. That transition has caused some issues. Apart from the involvement it had in the first generation of the OneWeb network, the UK does not have a satellite operator for very large numbers of satellites, and we do not have the industrial capacity to build one. I see this as a particular issue that we will have in the future which we will need to address. Where do we see ourselves in the UK with these new LEO constellations and the manufacture of them?

The other new market which has appeared is direct from satellite to a mobile phone. This is quite a revolution as well, and there we see the problems of convergence. How do we converge satellite communications with terrestrial mobile communications? Satellite operators and mobile operators are in two different camps, but we see them coming together now to deliver these services to handheld. That is making quite a big difference to business models and value chains. I see this as being quite a revolution in the satellite community which we will have to address as we go forward.

**Viscount Stansgate:** I have a quick follow-up, because other people have many other questions. In what way do you think AI technology and quantum computing in the future might affect the telecommunications that you are now talking about?

**Professor Barry Evans:** AI certainly has a big effect. The future network, as we move from 5G to 6G technology, is going to be what we call a native AI network—it is going to be built into the network itself.

As far as these large constellations are concerned, they are very complex. Not only do you have very large numbers of satellites in orbit, which you have to control and command the resources for, but you have the ground segment, with a large number of feeder links and gateway stations, et cetera. All this needs AI, both in the resource allocation and how you control large numbers of satellites in orbit so that they do not collide with each other or debris by changing their orientation slightly, and how you organise and manage the whole constellation system itself. AI has multiple uses, and it will play a big part in our future.

**Viscount Stansgate:** Does anyone else want to comment or can we move on?

**Joanna Darlington:** I agree with that. The point about the ground segment is particularly true, which tends to get ignored. People think

about the satellite constellation, but just as important is the ground services.

**Simon Hill:** I have one small point to add. We are engaged in a UK Space Agency C-LEO project to develop a small size, weight and power terminal that will enable you to connect to multiple orbits and bands. Our intention is to build some AI modelling in, to allow it to determine what to connect to and when, based on whatever rules it gives you. It is the same principle really, just on a different part of the system.

**Q80 Baroness Bonham-Carter of Yarnbury:** What are the biggest challenges that your business will face in the coming years? Joanna and Simon, you have mentioned what is happening across the Atlantic. As I understand it, the share prices of Eutelsat have withered recently. To what extent are your firms resilient to what is going on in an incredibly fast-moving world?

I have one supplementary, which is on a slightly different issue, but I will start with Joanna on this question.

**Joanna Darlington:** You are right about the share price and, in fact, the whole of the sector. There are some listed satellite operators—

**Baroness Bonham-Carter of Yarnbury:** It might have changed today. That was flippant; I am sorry.

**Joanna Darlington:** No, not at all. We have seen a huge amount of volatility. In fact, our share price has shot up like any vaguely defence-related listed company as a result of the fallout between Trump and Zelensky.

To go back to your initial question, you are absolutely right. One of the challenges we face is financing. It costs a lot of money to be in space. There was an earlier comment that the UK does not have a satellite operator. Today, it probably costs between £7 billion and £10 billion to build a new LEO constellation. The barriers to entry are enormous, so it is not a sector that is open to anyone. The other thing is that you have limitations in frequency, so there is no place for a lot of LEO constellations. In parentheses, I would say that that is why OneWeb is such an important asset, because there will be room for maybe only four or five of these constellations—there just is not enough room and frequency available for more.

The other barriers are technological; technology is moving very fast. To be candid, one of the main issues that we have faced is the incredible speed at which Starlink has developed, with all the support of the US. Musk has very deep pockets and a big advantage, because he is vertically integrated, so he does everything from building to launching to operating. The other thing is that he has had an awful lot of support from the US Government as a customer and in regulation, which is another thing we might touch on.

The FCC is very benign when it comes to its own home-grown operators. There are all sorts of challenges that we face as a global satellite operator.

**Professor Barry Evans:** I endorse what has just been said. We face a real issue with the Starlink dominance. At the moment, it has around 5 million customers, and it will probably have 18 million by 2028 and 50 million by 2035. It has the ability to expand its activity, not just by putting more satellites up but by having a huge heavy launcher, in Starship. When it gets going, it will be able to launch something like 60 terabytes per launch and could launch more than one per week. It will have a huge revenue engine there; I read recently that it is something like \$50 billion a year in revenue. That is huge and is approaching the revenue you have with mobile network operators. That is a big challenge.

The UK is so small that we cannot afford to have a LEO of that size. Both Europe and the UK are very much behind and are being driven by Starlink. This is a tremendous risk which we have to take on board, and I am not sure that people really understand that risk.

**Baroness Bonham-Carter of Yarnbury:** That is very interesting. Simon, do you want to add anything?

**Simon Hill:** This is not necessarily a problem for us per se, but I completely agree. We have public sector customers who come to us and say, "Can I have a Starlink please?" We take a very agnostic approach to connectivity, on a case-by-case basis. We tend to blend lots of different types of connectivity in order to give that resilient and redundant piece.

I believe there should be some steering within public sector organisations that are using satellite as their insurance policy if their day-in and day-out connectivity goes wrong. Careful consideration should be given to what choices are made as opposed to saying, "My boss has Starlink on his shed and it's great". Starlink is a fantastic product in the right place, but there are much bigger considerations in my opinion.

**Joanna Darlington:** You are absolutely right for the consumer sector. If you look at our business, which is very much B2B and B2G, you find that it is crucial. In any type of business, you do not want a monopoly with a single supplier, whether it is Starlink or anyone else. That is just economics; nobody wants to put all their eggs in one basket.

The other thing that has been interesting in recent times is that Starlink, with its governance, has shown itself to be, in some cases, not necessarily the most reliable supplier. We have been getting a lot of inquiries from Governments and commercial customers who say that Starlink is threatening to cut people off just to get political leverage. We have seen it in Ukraine, but we have also seen it in Brazil and Mexico. We have sovereign customers that now come to us because they do not want to be reliant on Starlink due to its relationships with various other Governments.

It is interesting to understand that all these companies that are within the space landscape need support. As you know, HM Government has 10% of Eutelsat, which is the parent company of OneWeb, so it is very important to recognise that.

**Baroness Bonham-Carter of Yarnbury:** Sorry to throw a bit of politics in here, but I think the unintended consequences of Trump are going to be interesting in all kinds of areas.

It is something we are not specifically discussing today, but I would like to ask— Simon in particular, because he said he set up the business— whether there is a skills problem in the UK for the kinds of things you three require.

**Simon Hill:** For the areas that we at Excelebrate specifically require, I do not see a skills problem. Satellite is a part of what we do, and we have some fantastic people working for us. It is usually very difficult to get someone who can cover all the bases, as it were, because we are doing live video streams and—

**Baroness Bonham-Carter of Yarnbury:** But you do not see a shortage. I have gone off-piste with that question.

**Professor Barry Evans:** I am not sure I agree with that. In the Non-Terrestrial Networking Expert Working Group, which is mainly comprised of industrial companies, the biggest thing I got from those companies was the skills shortage and the difficulty they are having in recruiting people with the necessary skills to build the next generation of satellite systems.

Q81 **Baroness Bonham-Carter of Yarnbury:** That is now on the record, and it is an important part of our investigation.

I am not so knowledgeable about this—my colleague who was going to ask this question has left—but how important are commercial satellite communication firms for national security and resilience? Is dual-use technology the future? You have all mentioned Ukraine, so I suspect this has been a good way of exploring this.

**The Chair:** I am afraid we are getting to the point where answers are going to have to be short and sharp, if we are going to get through our questions.

**Joanna Darlington:** I will be short and sharp. It is absolutely crucial. We have seen that sovereignty in space has become as important as it is on land, sea and air. A lot of Governments are investing in that. We have spoken about the US and its backing for Starlink. Look at the EU, it is launching a big multi-orbit constellation and investing €10.6 billion for two reasons: to reinforce its sovereignty and not be dependent on the US or China; and to support its own space industry, including the incumbent operators and manufacturers but also new space.

**Simon Hill:** I do not really have anything further to add.

**Baroness Bonham-Carter of Yarnbury:** The chair will be happy.

**Professor Barry Evans:** On the dual-use situation, I agree that IRIS<sup>2</sup>, which is a European Union project that the UK is almost excluded from, is developing a more secure and government-connected situation. We have an issue here, where the UK finds itself outside the remit to build constellations, which will provide these dual-use considerations for the future. We have an issue as to how we provide that. We do not have the ability to do it ourselves and we should be looking for additional partners elsewhere—maybe Canada, which has a Telesat system coming up for development, or maybe even collectively through the AUKUS group of partners in the future. That is an issue that we need to address.

**The Chair:** That leads very well into Lord Shamash's question.

**Lord Shamash:** How important are commercial satellite firms for national security and resilience, and is dual-use technology a thing for the future?

**The Chair:** Your question is about how the UK fares globally when it comes to innovations.

Q82 **Lord Shamash:** I apologise. At that moment, the dog was downstairs barking its head off, so I was wondering if something exciting was happening.

Can you provide an overview of how the UK fares globally when it comes to innovations in satellite communications? Is this an area in which UK academia and industry has particular prowess?

**Professor Barry Evans:** We have been quite good in innovation in the satellite communications area. Here at Surrey, we were the first university to build, launch and operate a small satellite. We have a spin-off, Surrey Satellite Technology, which continues to produce satellites. That is one example. There are lots of other areas in the UK that have contributed through RF equipment, where we have innovated quite a lot via Filtronics, and in ASICs, where EnSilica is producing the design for chips for the AST mobile satellite system.

We have quite a good industry, but it is not a large-scale industry. It is made up of SMEs, which need support, particularly in the new era that we see, with direct to phone communications and so forth.

The academic community is very good on wireless, but it has not necessarily transferred into the new area of non-terrestrial networks with large constellations. For instance, Germany has projects worth €1 billion. There are 10 or 11 projects in non-terrestrial networks which are nationally funded. The UK has nothing. Other countries in Europe have national programmes on non-terrestrial networks. We do not have that at all in the UK, so we are missing something there in supporting academia.

**Simon Hill:** I agree. There are some fantastic businesses and academics working in space in the UK. However, there is a massive risk that

anything that is being developed just gets swallowed up by someone with very deep pockets. That is something we have to be very conscious of and work out how we can elevate those companies and the developments that are being made.

**Joanna Darlington:** I have nothing to add.

**The Chair:** Lord Booth-Smith, to some extent your first question has been answered, so you may want to skip lightly over that and move to the next one.

Q83 **Lord Booth-Smith:** Do not worry; I was planning to do so in the first place.

There have been reports about the importance of spectrum regulation, with the FT stating that this could shape the new space economy. I would be interested to know, from your perspective, if this international regulatory environment for spectrum as we currently have it is fit for purpose? Do you think there are changes that we should be actively advocating for with partners globally?

**Joanna Darlington:** That is an interesting question. The satellite industry historically has been self-regulating. Spectrum matters tend to be overseen by the ITU, but people have always come to a gentleman's agreement, and we tend to be quite polite and respectful. That is changing because space is changing quickly, and you have all these issues which we read about every day of space debris, light pollution and low-orbit constellations. I would say that the regulators are really rushing to catch up.

In our experience, Ofcom is a fantastic regulator, and it has done some really great things, notably by facilitating bringing OneWeb, the first low-earth constellation, into use. It is very strong on space sustainability and debris. Where it could be more vocal—obviously, it has to be an independent voice within the UK—is in international forums, where it is important to defend the UK and, broader than that, European rights. We have some regulators, particularly the FCC, that are much more partisan and aggressive. It is becoming an issue, as I mentioned earlier.

**Professor Barry Evans:** Spectrum is the lifeblood of satellite communication, so it is incredibly important. At the moment, spectrum is allocated on a four-yearly basis by the World Radiocommunication Conferences, organised by the International Telecommunication Union. There is an issue here in that a four-year gap, with the rapid developments that we see in modern satellite communications, is probably a little too long.

It was interesting that the US regulator, the FCC, broke ranks a little last year and decided to promote new regulation for satellites for complementary communications from satellites from space to handhelds in the US. That enabled the business to go ahead, particularly with companies such as Starlink and AST SpaceMobile, which would not have

gone ahead if it had not been for that, as it were, until the next World Radiocommunication Conference. That kind of thing is not fit for purpose.

We have to be very careful. Look at the developments in Starlink—the amount of spectrum it requires is huge, particularly in the mobile satellite bands. We need to be a little careful that it does not mop up all that spectrum.

Having said all that, Ofcom has been a remarkably good regulator compared to a lot of the other regulators in Europe and the world. It is doing a reasonably good job, but what you have to understand is that its remit is to take care of the user. This conflicts a little perhaps with the national and sovereignty aspects that come along. From that point of view, there is a little tension.

**Lord Booth-Smith:** In the interests of time, and given that there is a broad agreement that Ofcom is doing a half-decent job but that there are lots of things that we need to discuss—which would be an evidence session in itself—would it be possible to ask people to respond in writing to the particular point of how Ofcom can play a slightly larger role, particularly given international comparators doing slightly different things? That might be beneficial.

**Baroness Bonham-Carter of Yarnbury:** I support that suggestion. The Ofcom role is quite interesting to us.

**The Chair:** Absolutely, and there may be differing views.

I am afraid bite-sized responses are needed from now on, as we move to Lord St John.

Q84 **Lord St John of Bletso:** We are interested in the UK's international partnerships with other space agencies, especially given the recent geopolitical tensions. Can you comment on your recommendations of how the UK should position itself for commercial partnerships and for security and defence, as well as for scientific collaboration?

**The Chair:** I am afraid that is quite a few questions, but please just encapsulate them in your responses.

**Joanna Darlington:** It is worth placing on the record that the UK is already a significant international leader in space. The UK Space Agency already collaborates closely with ESA, the European Space Agency, and has done so for many years. That is important to continue. Obviously, Brexit has not made that collaboration easier, but on partnering and the stance generally, we have a lot of ties with the EU already. I represent an Anglo-French company, for example, I will leave it at that.

**Simon Hill:** I agree. The alignment with the European Space Agency is important and should grow. We should also be trying to make sure that we have enough of our own sovereign capabilities at the same time.

**Professor Barry Evans:** I agree with that. The UK Government should be negotiating with the EU on our position in the IRIS<sup>2</sup> system. We should keep our involvement in partnerships with the US. In the future, the situation will be that we have to work with a number of partnerships and have the ability to engage with them on the end-to-end management system. We need to keep it open.

**Lord St John of Bletso:** I have one very brief supplementary. We are aware of the established relationships with ESA, NASA and JAXA, but what about emerging space nations, such as in Asia and Africa?

**Professor Barry Evans:** ESA and the EU are very good on partnerships. We have partnerships with Japan at the moment; the European Union has partnerships with Japan, South Korea and Singapore. We do have these partnerships going on right now.

**The Chair:** We have votes coming down the track in a few minutes, but we will go to Viscount Stansgate.

Q85 **Viscount Stansgate:** The UK Government have invested heavily in the development of launch capability to the tune, we understand, of about £111 million. Is this a good investment or could the money be better deployed, perhaps to support satellite communication capability? If the UK does develop a sovereign launch capability, will your firm seek to use it?

**Joanna Darlington:** Candidly, speaking as a large commercial operator, for us it is not a very good use of that money. To launch a geostationary satellite, you need a heavy launcher. The LEO satellites, which are a lot smaller, launch in batches of 20 or 30; you need the heavy lifting of the types of businesses that are already established, such as Ariane, ISRO—the Indian launcher—and Mitsubishi Heavy Industries. For one-off launches of small satellites, we may use them, but they are already very big and well-funded established players, and it is a very expensive business. If it was me deciding where to put UK investment in space, I would not necessarily focus on launch. I would focus on developing new tech and continuing the great work that is being done in the UK universities and start-ups.

**The Chair:** Are there any contrary view to that?

**Professor Barry Evans:** I agree absolutely. There is huge competition with large launchings at the moment, particularly SpaceX, and I fail to see that there is a real business in it. I am not sure I would agree that it is a good investment.

**The Chair:** Lord Lansley has two questions about OneWeb. Perhaps he would like to telescope those. These questions are to you, Joanna.

Q86 **Lord Lansley:** Without rehearsing the history too much, we want to look at previous recommendations of Select Committees in the two Houses. The Commons Science and Technology Committee talked about maximising taxpayer value from the OneWeb investment and particularly

referenced the manufacture of Gen2 satellites. I wonder if you might tell us a bit more about that and the choices that have been made.

In addition, but more on the aspect of looking forward, you said that there may be the potential for four or five large-scale constellations. Where do Eutelsat and OneWeb sit in that? Is it the core of a combined European system that is one of those major constellations? What is the model that you are looking toward?

**Joanna Darlington:** The first question was about manufacturing. Sadly, as was referenced before, we do not have any small sat manufacturing capability in the UK at the moment. Historically, Eutelsat relied heavily on Airbus and Thales for manufacturing geostationary satellites, and a lot of that was built here in Portsmouth, at Belfast and other sites. For small sats, there really is no capability here.

The other reason we do not build them here is that, as I mentioned before, they require a lot of funding. The only way we can fund them is by export credit finance, which in this case will be supplied by the French export finance credit agency, because we will be building those satellites in France and they will be "exported to a UK company", which is OneWeb. We simply could not do that if it was manufactured in the UK, unless there was financing that was forthcoming.

On your second question, Eutelsat is one of the key members of the IRIS<sup>2</sup> constellation, which the EU will launch at the beginning of the 2030s. We are investing €2 billion in that and, in exchange, we will get to commercialise the proportion of the LEO capacity which the EU will not keep for its sovereign needs. That will be about 75%, or 1.5 terabytes, which will, in effect, complement the current OneWeb constellation. It is a way of extending OneWeb through a public/private partnership, rather than having to take all the funding for ourselves, which is becoming increasingly difficult.

**Lord Lansley:** I know it is moving on but, incorporating this question about IRIS<sup>2</sup>, I wonder if we might go back to Professor Evans, if he does not mind.

**The Chair:** Shall we just ask the question about the IRIS<sup>2</sup> platform?

Q87 **Lord Lansley:** Where does the United Kingdom stand in relation to our participation in IRIS<sup>2</sup> and how does that fit with our stake in Eutelsat OneWeb? How does it fit together? Please venture a thought on that. I got the impression that Professor Evans felt quite strongly about it.

**The Chair:** Joanna, would you like to say how the development of the EU's IRIS<sup>2</sup> programme is going to alter the operation of OneWeb? We will then take the more general question that Lord Lansley would like to put to Professor Evans.

**Joanna Darlington:** It won't alter OneWeb. OneWeb remains a UK company. The UK Government have a golden share, which enables them to prescribe certain things that we can do. Part of that is where it is

headquartered, where it has its customers, et cetera. OneWeb will remain.

Unfortunately, as the company that owns OneWeb, it is a big constraint for us that the UK is not part of IRIS<sup>2</sup> at the moment. We lament that very much. Obviously, we lobby quite hard as a company to change that.

The fact is that OneWeb is fully integrated within Eutelsat; the two businesses are fully integrated. There will be benefits for OneWeb in the future as part of a company which is operating a much larger LEO capacity, and not the least of that is the €6 billion of funding that the EU is putting into the IRIS<sup>2</sup> programme to develop the new technologies that will be embarked on that constellation. We could not do that ourselves for OneWeb; it would have had trouble financing that.

**The Chair:** We are just beating the bell, so a last question to Professor Evans from Lord Lansley.

**Lord Lansley:** Would you be kind enough just to elaborate a little on why and how the United Kingdom could participate in IRIS<sup>2</sup>?

**Professor Barry Evans:** At the moment, UK companies are not allowed to bid for certain aspects of the IRIS<sup>2</sup> system. We are locked out of anything to do with military aspects or security. We might have something at the lower end of the food chain in the system. The UK has 10% shares in Eutelsat—the UK Government, after all, invested half a billion, I think, into OneWeb initially to keep it afloat—so it is very important that the UK Government discuss a bigger part for the UK in the production of the OneWeb Gen2 system.

**Lord Lansley:** In so far as we do not actually have a pay grade, we are allowed to discuss these things. Although it may also be outside your remit, there is a question about the extent to which the UK at the moment is engaged in a reset of relationships, including, specifically, where defence and security are concerned, with the European Union. That raises, as it were, new opportunities. I get the impression, without your having to say so, that you definitely think these are opportunities that should be seized.

**Professor Barry Evans:** Definitely. You have hit the nail on the head there; that is part of a negotiation which should be taking place.

**The Chair:** Thank you very much. We have succeeded in completing our session before the vote comes, so thank you very much for your brevity. I will suspend the session and thank our witnesses very much indeed for giving evidence to us today.