



Scottish Affairs Committee

[Oral evidence: Scotland's space sector, HC 150](#)

Monday 13 May 2024

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[Watch the meeting](#)

Members present: Pete Wishart (Chair); Wendy Chamberlain; Sally-Ann Hart; Christine Jardine; Douglas Ross; Michael Shanks.

Questions 398 - 499

Witnesses

I: Colin Macleod, Head of Space Regulation, Civil Aviation Authority.

II: Scott McClelland, Unit Head, New Market Clusters Unit, Scottish Government; and Rory McGregor, Team Leader, New Market Clusters Unit, Scottish Government.

III: The Lord Cameron of Lochiel, Parliamentary Under-Secretary of State, Office of the Secretary of State for Scotland; and Dr Paul Bate, Chief Executive, UK Space Agency.

Written evidence from witnesses:

– [Add names of witnesses and hyperlink to submissions]



Examination of Witness

Witness: Colin Macleod.

Q398 **Chair:** Welcome to the Scottish Affairs Committee and our ongoing inquiry into the space sector in Scotland. In our first of three panels of witnesses today, we are joined by, Mr Colin MacLeod from the Civil Aviation Authority. I will let Mr MacLeod introduce himself and make a short introductory statement.

Colin Macleod: I am the Head of the Space Regulator in the UK. The Space Regulator has been in the CAA for just under three years now. Our key responsibilities are, first, keeping the public safe, and secondly making sure we have sustainable orbit and space activities; thirdly, we do all of that with an eye to efficiency and effectiveness for the sector. We are there to enable the sector, not to stop it necessarily.

Since we started, in the last three years we have issued round about 350 licences. A large number of those are satellite licences for OneWeb, which is the second largest constellation in LEO in the world. We have also seen the first European launch into orbit from Spaceport Cornwall with Virgin Orbit, which, while it failed to reach orbit, did exactly as we wished it to in terms of safety, so there was no property damage and no one was hurt. Particularly of interest to this Committee, we have recently given licences to SaxaVord for their spaceport and range operations.

I think we are very well placed now. We have certainly had a very strong focus on continuous improvement, working with the sector and trying to be as agile as possible, as I say, to enable its activities.

Q399 **Chair:** Excellent. Thank you very much for your written evidence, which the Committee very much appreciated, particularly the positive tone. There does seem to be a pretty positive reception from the sector. How did you go around building these relationships with the sector? What issues did you have in conversations, and how have you managed to get to where we are now?

Colin Macleod: Yes, we worked very hard with the sector on our engagement plan and engagement strategy. We are very fortunate to have built a regulator from scratch, which gives us lots of opportunities. Regarding the key things we did when we started, while we recognised the regulations that we work with are quite difficult, we were able to set up a good business case that allowed us to make sure we had the right level of skills, capacity and capability. It also allowed us to have an optimism bias. I assumed that our engineers would only be about 60% as effective as the equivalent FAA engineers who had been doing this for decades, so we had sufficient capacity and capability in-house to work with the sector.

We also set up the Space Launch and Orbit Group, which is a three to four times a year engagement between us and the sector. The first 18



months or so were primarily us explaining to the sector what the rules and regulations were and how we would operate as a regulator. In the last sessions we have started getting more back from the sector. We want it to be a two-way engagement. We involve academia and the sector is now picking up some activities and actions around looking at environmental impact assessments, which is something they found particularly difficult.

Finally, we have tried over the last three years to look continuously at our systems and processes to try to find ways to improve them, make them more efficient, and to listen to the companies. We have developed products such as safety case workshops and assessment of environmental effect workshops, which are two of the bigger challenges to some of the companies, and we have also improved our guidance. This week, I think on Wednesday, we will have an update on quite a batch of our guidance, to make it easier to understand and more relevant to the companies. That is all based on feedback from them as well as our operating teams.

Q400 Chair: What is your agenda going forward? What are the continuing ongoing challenges? They seem to be around the guidance. We are hearing that a bit more work might be required of that. Roughly how would you see it going forward?

Colin Macleod: We have done this quite large batch of guidance revision over the last six, nine months probably, and we have changed the regulator's rules in particular, which were set at quite a strong level by Parliament in the way they were implemented. We found ways to make that burden a bit less for the companies, particularly companies that come to us more than once. We try to use previous information they have given us wherever possible to reduce that kind of burden. Going forward, we want to continue doing that.

We have several continuous improvement projects going this year based around different licence types and different challenges. What is also coming to us now is that space is very innovative, the pace of change is high, and while we have mainly had a focus on spaceports and a small number of launchers, we are now seeing new activities around orbit servicing and manufacture and lunar missions. I have seven launch companies speaking to me from all around the world who are interested in launching from Scotland, Some of the fundamentals are changing more slowly, but more challenges are coming towards us because of the sector's drive and direction.

Q401 Chair: Most of the interest quite rightly is on launch and you mentioned two in your introductory remarks. The one in Cornwall you described as a success, and I think we understand that it not always required to go to space for lessons to be learned and for progress to be made. The other one, of course, is SaxaVord. Is that all now concluded and everything set up so there will be launch from SaxaVord, and is the CAA satisfied with the arrangements that are in place?



Colin Macleod: We are satisfied that arrangements are in place for the spaceport and the range, which is keeping clear of the maritime and airspace areas to protect the operators there. There is no currently licensed launch operator who can take advantage of those activities yet. I cannot talk about individual cases but I can tell you that there are multiple launchers in various stages of the process.

Q402 **Chair:** Could you explain to the Committee what those companies would have to do to satisfy you that all the safety issues were dealt with and addressed?

Colin Macleod: Absolutely. A launch licence for an operator, like most of our licences involves seven key tests. Safety for the public is the primary one. We have to take into account an environmental assessment as well and there is a range of other tests around national security, national interest, fit and proper persons. Operators have to cover a range of things.

We estimated when we started that this work could take nine to 18 months. We have now reassessed that and we think that nine months is a reasonable expectation for these licences, assuming that the operator is technically capable of delivering the assessments required and has the skills and capabilities in-house to work with regulators.

One of the key problems we find with new companies is that they do not necessarily have a strong regulatory background. Some of the big military primes, who are used to operating these environments, have regulatory teams that can help. Some of the smaller companies struggle a little bit with that. Nine months would be a good result for an operator but it could be nearer to 12 to 15 months for new operators.

Q403 **Chair:** Given a lot of this activity is in Scotland—I think six or seven sites have been identified as possible sites for launch—would the CAA consider moving more of its space staff up to Scotland to be available on site?

Colin Macleod: We do have an office already as the CAA in Stirling and we can use that. The CAA space team was set up during Covid and is quite hybrid in nature. We have people spread over the UK. We have two people who live and work in Scotland already. Depending on the cadence of activities in SaxaVord, Sutherland or other parts of Scotland where they are working, we would certainly be looking at how we can have closer support, because at the moment people travel from all over the UK to go and support these activities. That is right at this point in time because there are not that many activities and we can be quite precise, but as things scale up, we can be flexible to do that.

Q404 **Chair:** Lastly from me, given that there is almost a subdivision already—that is the impression I have from your comments here—might it be more convenient and elegant if there were a specific UK space agency, as opposed to everything being under the management of the CAA?



Colin Macleod: That is a very difficult question. I have been asked this by other Committees in the past. The space regulations that we are operating under have only been in force for just under three years. Certainly, in my experience of speaking to peers around the world in other countries and to other regulators, the UK's approach is recognised as a very good one from a space perspective, keeping the public safe and the environment being considered. We are one of the few places in the world where the CAA as a regulator both licenses and regulates the spaceports, the range, the launch vehicles and in-orbit activities. Most other countries spread these responsibilities among a number of regulators. From that perspective I think it is probably a bit early to consider what more we could do.

Another big challenge is with some of the other regulators we work with—be it environment regulators, SEPA, maritime agencies, the Health and Safety Executive or even sometimes the police and local authorities and planning; bringing together all those activities under a single regulator would be quite challenging. I have to say we did look at a lot of this when we were considering how we built the space regulator and when we were considering where the space regulator would sit, either as a standalone body or within another organisation. A lot of these aspects were considered in 2020 when we were developing the plans for the new space regulator.

Q405 **Chair:** I have the impression that it is not set in stone and that if a case emerged for a distinct and separate space agency, that would be something you would look at as an ongoing conversation about this.

Colin Macleod: Two things: the first is that as an effective regulator our key concerns are public safety and helping the sector. Now what I mean by helping the sector is being as efficient as we can be, getting the right processes, being appropriate in how we ask for information, what we demand, and how we look at it. Secondly, in my view an independent safety regulator is critical. We are independent because of historical evidence.

In 1986, when Challenger exploded, the inquiry found that part of the reason that there was a tragedy was that there was too much pressure to undertake the space activities from an economic and growth perspective. Pressure was put on and the flight took off when it probably should not have done

The second reason, which is more UK-focused, is Piper Alpha. In 1988, when Piper Alpha had a problem, the lessons learned coming out of that was that safety regulation should be kept out of the hands of those are responsible for growth, economy, jobs and so on. I think that is a particularly important aspect and that is why we have independent nuclear regulators, chemical, health and safety regulators and so on

With that background, there is no reason you should not consider it but that, to me, feels like one of the red lines in protecting the public.



Q406 **Christine Jardine:** Thank you for coming along. I was very interested in what you were saying there about the independence of the regulator being critical. Something mentioned when we were up at SaxaVord was that general airspace management is being looked at just now. To what extent has the airspace management exercise that other parts of the CAA are working on with all our airports, all at the same time, all competing for airspace, been taken into account or is impinging upon the need to manage space for space launches?

Colin Macleod: That is a very big question and it is not just space that is important here; it is future flight, electric flight, RPAS, drones. I can say, while I am not a deep expert in the airspace area, that we work very closely with our colleagues in airspace, and there are certainly a lot of debates and work to be done on airspace users. It is not just the UK that has this challenge. This is a big challenge for Europe and other countries as well, including ICAO.

I should have probably mentioned this earlier in answer to the question about the regulator: one of the key reasons why the CAA was chosen as the regulator was because all the space activities have to go up through airspace and then come back down through airspace if needed. That helped us hugely with the first launch by Virgin Orbit and it is helping us to shape and help airspace colleagues make sure that we can limit the impact as much as possible while, critically, maintaining, public safety.

Q407 **Christine Jardine:** Has either exercise held the other up? There is a lot of delay in the airspace management programme. Is it impinging upon your own area or vice versa for that matter?

Colin Macleod: Not at this point in time. In the two and a half years we have been doing this, we have discovered that most companies who are involved in the space sector—not just the UK; this is a global phenomenon that I hear when I speak to colleagues in the FAA and other countries—all identify this thing we now call space time, which is that companies, for various reasons, set themselves publicly ambitious targets, and their biggest challenge is normally their technical capability to meet them. They quite often come up with a brilliant idea but they underestimate the time it takes them to develop that concept into implementation.

That has meant that if some of these companies met their original publicly stated timelines, it would be very difficult for us to achieve some of the airspace changes that they would need to operate—not impossible, because we do this all the time. The airspace is very mature and we change things all the time for military or royal flights or whatever other reason, so it is not impossible. At the moment though, as I sit here, we have not had to stop any space activity since the CAA started, be it orbital launches, orbital activities or spaceports, because we managed to keep ourselves off the critical path to the activity, and that is where we want to keep ourselves.



Q408 **Christine Jardine:** You mentioned that one of the important things, or the most important thing, was public safety; presumably that is a huge part of what you take into account—public safety in the use of airspace and, as you say, getting through it?

Colin Macleod: Absolutely. There are lots of things that can be done in terms of mitigations for public safety. One of the reasons that space, as in the Virgin Orbit example, can fail safely is that we can set very large clearance zones or danger areas where, if something goes wrong, no one gets hurt. These areas can be reduced once you start getting flight heritage and operators and vehicles become much more reliable. Early launch vehicles are inherently unreliable. You can do more and more of that as you get better and better at it.

Q409 **Douglas Ross:** Good afternoon, Mr Macleod. In your evidence, page 4, at point 19, you discuss the challenges of launching from the UK, and you speak about expertise and experience held by the applicant organisations. You have touched on that. You go on to say that operators can understand if they have sufficient skills. What are the sufficient skills you are speaking about there, and how well is it understood? Do the operators understand when they come to you and you give them feedback? Are they aware of what is needed, what is required, before they submit applications and is there a range? You said that some are very experienced and some are new to the industry. How do those operating in Scotland compare with others around the UK in terms of that level of experience?

Colin Macleod: I don't think there is any difference between Scottish operators and any other operators, be they European or American or from other countries. The range is very wide. That is one of the things that we are trying to reduce with our engagement programmes.

I was speaking at a conference last week on in-orbit service and manufacture. It was great and at the end of the conference there were a couple of sessions where new companies could pitch their ideas and I was able to go and speak to them afterwards. Doing that, we could start the engagement early. They all knew that they needed to speak to the regulators, but they had not worked out how or when to do it. We always say you come as early as possible, we will try and help as much as we can.

The kinds of skills you need are people who are good at project management, who can build the right framework for matching the technical development with their regulatory and other requirements. People who have some experience of legislation are always helpful. However, I have seen everything from chief execs coming to me with a licence application and telling me they haven't read any of the guidance yet, which is particularly disappointing because they are the ones who have to sign it, to companies who have come forward with a completed safety case with loads of detail because they have read everything and had a very good go at it. So you get the extremes.



We want to do far more in support of the newer companies because the earlier they come to us, the more chance they have of success for their mission within their timescales, which are normally related to their income streams from their investors.

Q410 Douglas Ross: Following you today, we have panels from the Scottish Government and the UK Government. Is there anything you would request from both Governments that could help the work you are doing and the work that applicants are having to do?

Colin Macleod: We work very closely with the Governments and the Space Agency. I should also say we are very well supported by DfT with funding. There aren't very many things that we are concerned about. We have lots of benefits as an independent regulator as well. We are quite agile, so we are probably a bit quicker to react to some of the things that we see than other parts of Government, which is just natural. I think continuing the ongoing engagements and relationships that we have is probably the most important thing.

Q411 Douglas Ross: We have UK space strategies and Scottish space strategies. Do you feel there is good working between the two Governments? From what you can see, is there anything that you would highlight in one over the other?

Colin Macleod: I don't think so. Strategies for space are very challenging to do because space is moving so quickly. As I said earlier, if I were sitting here two or three years ago, we would all be focusing probably on the first launch and then be focusing on something else. The strategies are quite difficult in space. The UK is not unique in also finding the challenges of linking the civilian strategy with the military strategy. They are becoming closer aligned than they used to be, but that is also because technology is changing.

I wouldn't say there is much I would call out between the two Governments. From the regulatory perspective, of course, I am very agnostic about the economic and growth aspects, so from my perspective, I always look at the strategies to make sure that none of the proposals risk an impact on public safety or health or the environment.

Q412 Douglas Ross: On that point, because I wanted to move on to it, do you think there is enough buy-in from the public? Do they look closely at applications, at the work you are doing, or do you think it only comes at the very end where there is a launch, be it successful or otherwise? Are we bringing the public along with us, particularly given that your key role is to keep them safe?

Colin Macleod: That is a very interesting question. My experience of doing this over the last few years and being heavily involved with the media, which is relatively new to me, is that there is a huge amount of public interest in space. Space generates a disproportionate amount of interest in many ways for the activities that we are trying to deliver, but the public is also very engaged.



I would say that certainly from a STEM perspective, that is something we focus a lot of our effort on; we also focus a lot of effort on working with the media in particular to share information. We view openness and transparency from us as a regulator as critical. We try to put out as much information to myth bust as we can. I would say a very good example of the challenges that we face, which was articulated in the media, was for the two or three months prior to Christmas, before the Virgin Orbit launch, we had a lot of reports in the media that the CAA was being too slow, too cumbersome, taking too much effort, taking too long. The day after the Virgin Orbit did not reach orbit, the media were saying that the CAA had done it too quickly, that we didn't have enough skills, that we did not have the right capacity, that we had got it all wrong.

Chair: We are very familiar with that.

Colin Macleod: So that is quite challenging. We work very hard with the public and the media to get that information out there. There is always more we can do, but the Space Agency also does a huge amount in this area and are very supportive of it.

Q413 **Douglas Ross:** You mentioned in your opening remarks about an update on a batch of new guidance coming out on Wednesday. The way you put it across, and maybe this is not how you intended it, is you find some issues that you have to resolve in your guidance and you shove them all out in a oner. Is that how you meant to describe it? Is that how it works? That seemed a bit strange?

Colin Macleod: Broadly. What we do not do is—

Q414 **Douglas Ross:** If the guidance is not working, why not change it straight away? Is it because others are in the application process?

Colin Macleod: No, no. If there is something fundamental, we can change it more quickly, but rather than have lots of iterative changes, we try to gather them together, working in conjunction with feedback from industry, feedback from Government and everyone else.

Q415 **Douglas Ross:** Looking at Wednesday, will there be big changes or things that we would probably expect and no major surprises?

Colin Macleod: There won't be any major surprises and if you are a space operator, hopefully, you would see them as helpful indications that we are listening and we are changing things to make it easier and better for you based on the things that you have told us.

Q416 **Douglas Ross:** So there is an ability to do it far quicker if required?

Colin Macleod: It depends. If it is things that we have control of, such as informal guidance, we can do that quite quickly. Some of the other challenges that we have are legislative—we obviously can't do legislative changes—and depend on Government policy. I have a legislative framework I work to but I also work within whatever policy Government have set and I cannot change how we operate within that.



Q417 **Douglas Ross:** Ironically, you need that growth and the investment push for that side of things to get the Government's attention, even though rightly, from a safety perspective, it is nothing to do with you. Is that fair?

Colin Macleod: Probably. We feed back to the Government where there are problems but we also take a very pragmatic approach in the CA in terms of what we try to identify for changes. We can't change everything on our wish list because we do not have sufficient resources to be able to sit and do everything. We prioritise according to what is coming towards us.

We look very carefully at the applicants we have and the applicants we are speaking to and try to make sure that they are covered as best as we can. Some of the lower-profile policies or missions where we do not have any active applicants are kind of parked. There is a little list of things that we might want to do there but we are not going to use our resources to do them until we see someone coming forward.

Q418 **Douglas Ross:** Finally from me, I don't know if you have been following our evidence but we have heard conflicting views. Some are very happy with your work and they think the timeframes are very good. Others have said they have had their licences granted in Germany rather than the UK. Do you understand why companies are still doing that despite the progress that has been made, and what impact does that have, with companies going outwith the UK to get their licences?

Colin Macleod: Regulatory shopping is a global problem. Most countries would prefer entities to be regulated within their own shores. It is far more complex than saying, "They are going to Germany." As I said earlier, most countries have very different regulatory approaches. Quite a lot of countries around the world have no space law whatsoever. Germany does not have a space law.

Q419 **Douglas Ross:** We have a UK-based company that went to Germany to get their licence rather than getting it from you.

Colin Macleod: I cannot talk about individual cases. What I was going to say was that companies can choose where they want to operate from, but British companies who are operating space activities are caught by our legislation and they can't go and license somewhere else without other activities such as registering. Foreign companies can come and operate out of the UK but they have to set up a UK office to do so. It is not quite as simple as saying there is a decision based on one specific regulation, because you have spectrum for satellites, in particular, and you have to have spectrum before you can operate. A lot of countries license their satellites based on spectrum without having much other consideration around things such as orbital sustainability or national security. It is very hard to say because there is no global agreement on how to license satellites. There is a lot of variation.



The other part of this is liabilities and insurance. Different countries have different levels of liabilities and insurance. Then you get into the realms of, well, different countries having different levels of financial support and investment. I think the UK package as a whole—the legislation, the legal framework, the liabilities and insurance—has led to lots of companies coming to the UK, and that is why we have seven launchers. I have lots and lots of foreign companies trying to come to operate from the UK because they recognise the value in the UK legal framework and package as a whole rather than just one element of satellite licensing.

Q420 Douglas Ross: When you see some that do not, that have the opportunity to license here and have the whole package here but go elsewhere, to Germany or elsewhere, do you look into that and see if it is just a financial thing with liability? Are there lessons you can learn from other countries if there is this regulatory shopping? If that is happening, how do you assess are you still attractive then at that point?

Colin Macleod: I prefer to use evidence. From the evidence we have in terms of the number of applications we get, it is not that simple to say why they are coming or not coming because it depends on a range of factors, which could be financial, legal or to do with their investors. There are lots of reasons why.

We do work very closely with our partner regulators around the world. We are building a very good network where we try to be agnostic about economics. I would work closely with government on economic aspects. For example, we charge £6,500 for a satellite licence in the UK. That is not to do with spectrum; that is just to do with the licence for the activities that we do.

Q421 Douglas Ross: Does that compare elsewhere?

Colin Macleod: It is hard to say because the standards are not the same. In the US, you pay for the spectrum but not for the licence. Sometimes in the US you have to pay for a bond for the spectrum, which is quite high. You get it back. But if you are a small company and you cannot afford to lay money aside for a bond, that is when you start looking at other jurisdictions.

We do work with other regulators, and we look at what companies say to us about why they have gone elsewhere. Sometimes we just do not hear. Some of those aspects are more related to the wider government policy framework, which the Space Agency and other Government executives can talk to, rather than the safety element, which is what we are primarily concerned about.

Chair: Wendy?

Wendy Chamberlain: I do not think there is anything, Chair. I am very comfortable that Mr MacLeod covered my questions in his replies to Douglas.



Q422 **Christine Jardine:** May I ask just one question to follow on from what Mr Ross was saying? It struck me, when you were talking about the different regulatory frameworks and all the rest of it.

You said that you feel it is very important that we have a distinctive space agency for safety to safeguard pressure from economic growth and commercial interests, such as we saw in Challenger and Piper Alpha. Do you feel that other countries might not take the same attitude and that that might, in some way, undercut the UK? Is there a danger?

Colin Macleod: At the moment, no. We see that it is currently different for all countries, but like the FAA and CNES in France and ESA and our partner countries, Australia and New Zealand, for example, all follow an approach where the regulator is independent. Some of them are not fully independent but they have carved out processes within their administrations to make it a separate decision-making entity rather than those like the UK Space Agency that have grants and investments and slightly different targets. Obviously, all the countries want public safety but most of them are separate, either clearly separate and delineated by legislation or are carved out administratively to be separate. Some other countries around the world do not always do that, but they are not necessarily following the same kinds of values as us in public safety.

Q423 **Christine Jardine:** Would you say that generally the public and companies—but specifically the public—can be reassured that the international approach is one that does put safety first and public safety?

Colin Macleod: Absolutely. If you speak to the companies, a lot of them will say very much that.

Q424 **Chair:** Lastly from me, being given responsibility for space regulation was added to your activities. Is the resource equal to that? Are you getting the necessary financial support to take on these extended responsibilities? I know you are sitting here in the heart of UK Parliament, so you are highly likely to tell me any further resource would be welcome, but could you give us a sense that you are securing the extra support that you need to do these activities?

Colin Macleod: I would contradict you and say I have no need for further resource at this point.

Chair: Rarely is that the case at a Select Committee—

Colin Macleod: As I said at the start, we were very lucky to set things up well. We included good contingencies, good optimism bias, and in some ways we are slightly helped because the sector did not, and is not, maturing as fast as they thought it would several years ago. We have not seen the volume of launch applications coming through in terms of their progress, but we did not expect see seven launches. We can deal with the capacity.

Another important point is we are a modern regulator so we regulate; we do not license. Five or 10 years ago you would be talking about the Space



Agency licensing satellites. We regulate activities and we then undertake a strong element of monitoring and oversight for all of those activities throughout the lifetime of those assets. That is a bit of a shift that does cause a slight burden for some of the companies, but other countries around the world are following that same way.

As we operate, we will probably see the number of our team who are currently involved in licensing, which is around about 25—a team of four does monitoring—shift over the coming years as we see more and more activities taking longer and longer timelines, and we will have more and more monitoring and less licensing. DfT has been good at supporting us financially and we have increased our budget over the last couple of years. We now have just over 60 full-time employees in the space regulator, which is now comparable to what we see in America. We do not license anywhere near their number of activities but pro rata we are getting to the point where the optimism bias has just about been dealt with. We are looking forward to the future to improve our monitoring and invest in more time there, because that is also where we can deliver continuous improvement for safety for the public and for the operators.

Chair: Excellent. Thank you. It is very unusual we have somebody coming to a Select Committee not asking for more resources, but there is always a first for everything. For today, thank you very much, Mr MacLeod. Anything else that you could usefully contribute to the Committee, please let our Clerks know in the usual way, but for now, thank you.

Examination of Witnesses

Witnesses: Scott McClelland and Rory McGregor.

Q425 **Chair:** We now move on to the second in our trilogy of sessions this afternoon to hear from the Scottish Government. We have two Scottish Government officials with us this afternoon. Please introduce yourself, say what your role is, and make anything by way of a short introductory statement. We will start with Mr McClelland.

Scott McClelland: Good afternoon, Committee. I am Scott McClelland. I head up the New Market Clusters Unit within the Economic Development Directorate within SG. I will let Rory introduce himself, and then I will give a bit of a context for the unit, and then a little bit around how the Scottish Government see the space opportunity going forward.

Rory McGregor: Hello, everybody. I am Rory McGregor. I am a team leader in the unit that Scott heads within the New Market Clusters Unit. Scott will set out some of the wider context. I have specific responsibility for the economic development aspects of space, industrial biotech and defence manufacturing.



Scott McClelland: Rory has alluded to the New Market Clusters Unit. Our full suite of responsibilities is split across two teams. On the one side, we have responsibility for cluster development and policy, and that is building a new programme to support the growth of future clusters. That is around the implementation of some of the actions within the recently published Scottish national innovation strategy.

The other side of the team that Rory sits on has specific responsibility for working with and growing a number of priority sectors. As well as the space sector, we also have the critical technologies cluster, which comprises quantum photonics and semiconductors, we have the robotics and autonomous systems cluster, we have industrial biotech, aerospace and defence manufacturing, and we also have the Michelin Scotland Innovation Parc up in Dundee, so we cover quite a broad remit within the team

I will make a couple of remarks around the space sector and how the Scottish Government see it. Clearly, and I think the Committee has heard this already in a lot of the evidence sessions, space is a fundamental aspect of modern life. Of course, Rory and I used space services to navigate our way here today.

From a Scottish Government perspective, we absolutely recognise the potential of the sector. According to the latest market projections—there are lots and they vary—we are looking in excess of \$1 trillion by 2030. It is clearly a sector with a huge global opportunity. We have recognised that through a number of government strategies, through the inward investment plan, the National Strategy for Economic Transformation, and again, most recently, our national innovation strategy.

You'll have heard this in a number of the evidence sessions, but I will reiterate some of Scotland's key strengths around the space sector. We are very strong particularly with small satellite manufacturing based around the west coast and we have strong data services and applications sitting around the east coast. World-leading academic institutions are doing fundamental research into this area, with activity that has participated in the James Webb Telescope and the detection of gravitational waves.

We have heard a little bit around launch capability and will soon have that gap closed, which will give us what we see as Scotland's real USP in this area, that end-to-end solution covering the full value chain for small satellites.

Another aspect is that we are doing it with sustainability at the heart. It is important to the industry in Scotland that everything is developed in the right way. We have a tight-knit ecosystem in Scotland as well, real strength in partnership between the engagement of industry, academia and government. I think that is demonstrated through the publication of Scotland's first space strategy—not a Government strategy, but a joint strategy between industry, academia and Government that I think sets



the foundations for future growth within the sector. There are a number of actions within that, and we are certainly committed to working in partnership with industry and academia to take activity forward.

Q426 **Chair:** Thank you for that. Of course you are right to reference the areas of expertise that we have in Scotland, small satellites, data retention and acquisition and also our other data services. Having launched two satellites, it is exciting.

What is your overall vision? Where would you see Scotland heading? When you talk about \$1 trillion by 2030, what is that going to be based on? We are hearing already that some of the technological issues around small satellites starting to becoming redundant; we are moving on to other things. Where do we go from where we are now in Scotland's space sector?

Scott McClelland: It is important to recognise the \$1 trillion figure is at a global level and we are not targeting that from a Scottish level. We have a joint ambition with industry and academia that looks at revenue figures and employment in the sector over the next decade, which are, I think, well known by this Committee.

You are right as well that we have a lot of strengths at the moment, but it is very clear that other Governments across the world are investing heavily in the sector, and they are catching up fast. We want to make sure that we are at the forefront of technology and keep ahead. One of the aspects that we have commissioned are a leading scientific body in Scotland—the Scottish Science Advisory Council—to report on the opportunities over the horizon of the next 10 to 20 years that build on the strengths within the existing Scottish space ecosystem, that build on the research activities that are under way through our current academic institutions and where the market is going. Which ones Scotland should be looking at? We are getting the building blocks in place now to explore what those avenues are, again, beyond the current strengths that we are staying in at that cutting edge.

Q427 **Chair:** Excellent. Obviously the UK Government have their own space strategy, and we will speak to representatives of the UK Government next. Does the Scottish space strategy differ in any significant way or are they roughly aligned? Tell us about the relationship between what you have put forward as the space strategy and what has been agreed, and the UK space strategy as it is currently set out.

Scott McClelland: The biggest difference between the strategies, of course, is that the national space strategy is a Government strategy. That is not what we have in Scotland. Ours is a joint strategy between industry, academia and government. Space is, of course, a reserved area. You would naturally recognise that there are a lot of areas within the national space strategy that we do not necessarily touch upon in Scotland, but broadly the direction is the same. We are both working towards the same direction, recognising the potential of particularly new



space and supporting the development of the sector obviously. From our perspective, ours is a very Scotland-centric focus but it plays a part within that wider UK ecosystem as well.

I do not think there is much in the way of difference or contradiction between the strategies, and that is reflective of the relationship between the Scottish Government and UK Government, particularly through the Space Agency colleagues, which is very strong.

Q428 Chair: The UK Government are currently reviewing the implementation of the Space Industry Act and the regulatory environment. Have you been involved in any aspects of that review?

Scott McClelland: We have been invited to some of the workshops to review that activity. We have been involved in that. From our perspective, it is good for us to be participating in that but more important is that the Scottish industry has that voice in that area. You heard about the engagement that Mr Macleod and the CAA have had with the ecosystem in Scotland. We would echo what he has been saying in terms of the strength of that engagement, which we continue to welcome.

Q429 Chair: Obviously, it is very exciting that we are probably going to have the first launch coming, hopefully in the next few months, from SaxaVord. This Committee was lucky enough to visit SaxaVord recently. Have the Scottish Government been fully supportive of the efforts and what do you see is the significance of us being able to secure a launch in Scotland for the first time?

Scott McClelland: It is extremely significant, and what has been achieved up there is brilliant. Rory and I have been up to site. We know Frank and the team really well.

What does it mean? Take launch away and I think Scotland still has a strong space sector, but as I mentioned, I think the real key aspect for us is having that end-to-end capability. In that instance, I think launch is absolutely critical to our ongoing activity and to our future proposition to the international market.

Mr Macleod also mentioned that a number of companies are looking to undertake launch activity from Scotland, so there is that international attraction piece. Again, I think it has been touched on that we have real strengths in satellite manufacturing and in in satellite data, but there is nothing quite like a rocket going into the air to inspire that next generation and really capture the imagination of people. From a STEM perspective and as an inspiration to future generations, I think it is absolutely massive.

Q430 Wendy Chamberlain: Thank you both for being here today, and please send the Minister our best wishes. I wanted to ask about the Scottish Government's investment decisions and approaches. How did the Scottish Government decide how to prioritise investment in spaceports and launch



capability?

Scott McClelland: It is fair to say that we are supportive of all spaceports in Scotland that can deliver local economic activity. The actual funding and support delivered for spaceports across the piece has tended to be at the operational activity level. Investment and business support is generally handled by our enterprise agencies—Scottish Enterprise, Highlands and Islands Enterprise and most recently South of Scotland Enterprise—but certainly we are very supportive of all spaceport development in Scotland. Together, I think it gives a complementary offering that provides a wider access base. The more capacity that is available, the more that we can attract from the international market, the better economically that will be for Scotland and the regions the spaceports are situated in.

Q431 **Wendy Chamberlain:** When you say “complementary”, one of the things that we were very conscious of when we were up at SaxaVord in March was that we were there just after they had received the £10 million of funding from the UK Government. Obviously, the Scottish Government had made a similar-sized investment to the other spaceport at Sutherland. Are those the decisions that are being made between both the Governments, or have Scottish Government been more focused on Sutherland and therefore the UK Government have stepped in? Is that a characterisation that you would recognise?

Scott McClelland: I do not think that is necessarily the case. I think that the funding that supported Sutherland initially was through a UK competition. There is funding going in from both Scottish and UK organisations. I think it would reflect that HIE was originally leading the development of Sutherland spaceport, so naturally we are investing in that. But in the same way as they support multiple businesses in the same sector across the region, they will likewise support any business activity from the spaceports.

Maybe it is also worth recognising that since Orbex took over the development and lead for Sutherland spaceport, investment from the Scottish National Investment Bank has been commercial funding and those decisions are taken independent of Ministers.

Rory McGregor: Highlands and Islands Enterprises funding originally, way back in 2018 I think it was, probably came at a time before arguably the Scottish Government had a formalised policy in place. You could argue that it is to HIE’s credit that they recognised that before we had even started seriously thinking about space as a sector, rather than as individual projects or an individual business.

Q432 **Wendy Chamberlain:** On that, where do you see the sector in two years? What does success look like in terms of your inputs?

Scott McClelland: Do you mean particularly from that spaceport aspect?

Wendy Chamberlain: Or just generally; what does the Scottish



Government see the sector looking like in two years? What does success look like, given the variety of inputs that we are seeing going into it?

Scott McClelland: We would expect to see continued growth in the areas that we have already seen, building on our existing strengths. We would expect to see a bit more maturity in terms of launch activity and launches away from both SaxaVord and Sutherland and moving towards more of a regularity of launch cadence.

Rory McGregor: There is a message in here as well—the message it sends to the global community and the global ecosystem that we are here and we have managed to deliver this.

Q433 **Wendy Chamberlain:** Finally, we did get from the University of Strathclyde—this was co-authored by our special adviser, Dr Malcolm Macdonald—that the development of a national sustained space launch capability without a sustained Government customer is probably unprecedented. What role do you see the for Scottish Government as a customer of the Scottish space industry?

Scott McClelland: We have certainly recognised the role that we can play. I think we engage industry a lot and have heard the need to move away from providing grants towards that long-term customer base. We are certainly looking at areas in our world of where we can become more of a customer of space services, space data. There is also, of course, a wider role around the UK Government that may have a larger customer base in this. It is certainly an area that we recognise and we want to take forward activities to explore what we can do in this area. Part of that is a better understanding and education across the industry and government to understand the capabilities that are on offer and how that can solve the challenges we face. There is certainly a huge opportunity within particularly a number of our agencies—SEPA, Nature Scotland and the like—to look at how they better use satellite data to deliver their services more effectively. I think that goes across the piece.

Rory McGregor: Equally, there are some areas—agri-tech, for example—where you can obviously see synergies, but in some other ways, if we play it cannily, there are good ways of public service delivery, how the Government and local government do their business, that could be fundamentally transformed, taking learnings from, say, the fintech sector.

Wendy Chamberlain: It is encouraging to see that you recognise this gap here, but also that there is an opportunity for the Government as well. Thank you very much.

Q434 **Douglas Ross:** Good afternoon to our witnesses. Could I, as MP for Moray, also send my best wishes to Richard Lochhead? He covers the same area in Holyrood, and I know there is a lot of local support up in Moray for him to make a full and speedy recovery, so if that could be passed on that would be appreciated.



Could I start by following on from Wendy Chamberlain's earlier comment? We have heard criticism during this inquiry about HIE's role in the two spaceports, SaxaVord and Sutherland. Do you recognise any of that criticism about early decisions that had been taken about more of the support from HIE, which is a body of the Scottish Government, going to Sutherland at the expense of looking at the benefits of both or of SaxaVord above Sutherland?

Scott McClelland: The decision-making process was probably before our time so we cannot comment on that activity. What we can say is that since we have been in post, we have been supportive of all spaceport developments. We know that HIE is certainly willing and able to engage with SaxaVord to explore other opportunities to support the industry as it is looking to support the other spaceports across its region.

Q435 **Douglas Ross:** Have the Scottish Government looked into some of the issues that have been raised? I know Minister Lochhead visited SaxaVord after there were some quite negative comments about the Scottish Government's engagement and HIE's engagement. Has that triggered some reflection within the Scottish Government, looking back at what was done, how it was done and what could be done better going forward?

Scott McClelland: My understanding is that HIE undertook a full review at the time that found there was no impropriety in activity within there, apart from—

Q436 **Douglas Ross:** HIE looked into HIE. Is that what you were saying?

Scott McClelland: Yes, I believe so. From our perspective, we have a strong relationship with SaxaVord, and particularly Frank and the leadership team. As you said, Mr Lochhead met with that leadership team recently and has again expressed his willingness to explore what we can do to support across Scottish Government. That means through our enterprise agencies and HIE, and they are certainly engaged in that.

Q437 **Douglas Ross:** The Chair was speaking about maybe some shift away from the smaller satellites to larger ones. We certainly heard that when we had a Committee visit to the US. You mentioned the Scottish Government's space strategy, but there is also Scotland's National Strategy for Economic Transformation, which talks about "space, leading Europe in end-to-end capability for small satellite design, manufacture and launch". How reactive are your strategies to changes in trends? If we are seeing a shift away from small satellites—it is still in your most recent document, Scotland's National Strategy for Economic Transformation—how are you adapting to the changing circumstances that we are hearing about globally, but also domestically here in the UK?

Scott McClelland: Within the Scottish space strategy there is an aspect of looking at what those future commercial opportunities look like that allows us to pivot and support where industry identifies commercial opportunities. I think we see a little bit of a mixed picture about the size of satellites. We continue to have a strong base within Glasgow that



focuses on small satellite manufacturing. It continues to see a very strong view in terms of what their order book looks like, and they are developing the infrastructure in space that allows leveraging of existing constellations to bring down space data and services.

I do not think we have seen anything that causes us any concern at the moment. We have activity around inward investment where we work with the industry to look at potential gaps and opportunities that we can look to, to bring in additional companies, so we can take forward activity in that area. Ultimately, if the industry see a change in direction that you have recognised and spot the commercial opportunities around it, it is for them to explore and go after, and we will support them in the ways they require.

Q438 Douglas Ross: But you are leading the strategy that enables and helps industry. Are you suggesting that you are not seeing that shift? It is certainly something we have picked up quite a lot just as a Select Committee.

Scott McClelland: There have been mixtures. I do not think we have seen that conclusively. I do not think it is right to say that we are absolutely leading that strategy as well. The Scottish space strategy is—I know NSET—

Q439 Douglas Ross: I am slightly surprised that you do not see the shift away from the smaller satellites. It was certainly highlighted to us as a potential threat to the Scottish industry, which rightly built up this reputation for expertise in this area. The global market seems to be moving away from the smaller cube satellites.

Scott McClelland: It is not something that I necessarily recognise but we will take it on board and look into it.

Q440 Douglas Ross: In answer to that, you went back to the Scottish Government's space strategy, which I understand is industry, and so on.

Scott McClelland: Yes.

Douglas Ross: But I was taking my quote from Scotland's National Strategy for Economic Transformation. How much feed-in do you have to other strategies? When there is a discussion about space in these other documents, where are they getting their expertise within those documents from? Is that still your department, your office, or do they just look up the space strategy and think, "Well, that was published in 2021, I think it was, so we will just copy that bit out of there."

Scott McClelland: It does come from us.

Q441 Douglas Ross: In that most recent document, you were still saying you wanted to lead the way in Europe, end-to-end capability for small satellite design; that was coming directly from you?

Scott McClelland: Yes.



Q442 **Douglas Ross:** I want to move on to some of the other evidence that we have heard during our inquiry about skills, and skills comes up not just in this inquiry but in many of the inquiries that we have looked at. Obviously, education is devolved but there is crossover between the skills needs and how that is developed by both UK and Scottish Governments. Where do you think we are in having the skills needed for the space sector at the moment and importantly going forward, and how would you rate the working relationships between the Scottish and UK Governments on this issue, because clearly it is important to both? Ultimately, however, with education being devolved, I think there would be more of an onus on the Scottish Government for this issue.

Scott McClelland: Where are we at the moment? We recognise that there are challenges across the industry. As you rightly noted, those challenges are not unique to the space sector. However, the space sector has strong growth projections that will need a significant increase in skills to match them.

We see a challenge to the lack of a clear articulation of what the skills need looks like. I know the Space Agency is doing a lot of good work around the space skills survey and the space workforce action plan. From our perspective, we do not engage too heavily in skills. Our skills agency, Skills Development Scotland, has participated in that activity and are working within the development of the space workforce plan.

Q443 **Douglas Ross:** How joined up is that? We probably all meet SDS in our constituency work, but SDS is obviously not a specialist in the space sector or what is needed. Can you explain how that would work? SDS obviously has the specialisms for training and skills, but not the industry. How does that all come together?

Scott McClelland: Within Space Scotland, the industry body, there is a sub-group looking at skills and Skills Development Scotland is a member of that group. The industry expertise is provided from industry and is bringing it together, with Skills Development Scotland, to engage across the ecosystem for education and learning to support that activity. Yes, they do not have specific space skills or space knowledge, but they work with industry as they do across all the other industries.

Q444 **Douglas Ross:** Do you think that is the best approach?

Scott McClelland: I think it is. I will admit I am not very knowledgeable when it comes to skills. That is why we have our skills colleagues in Skills Development Scotland. They are used to doing that job, working with industry to understand what the needs are and working with colleges and universities to support the enablement of that activity.

Q445 **Douglas Ross:** Finally then, because you mentioned colleges and universities, we heard from Fife and the City of Glasgow colleges, who did a joint submission to us. In their written evidence—I raised also this when they were in front of us—speaking about the Scottish Government, they said, “The Government needs to invest in skills. The sector simply



cannot grow without the development of the talent pipeline that enables it." This was very much a call to the Scottish Government to invest in skills and skills development. Is that happening and what more can be done? What more resources can be put towards this issue, which you agree, is a potential barrier to the sector growing even further?

Scott McClelland: I absolutely recognise and agree with that. It is fair to say that Scottish Government skills colleagues and the Minister for Education and Lifelong Learning have recognised that as well. What is happening at the moment in Scotland is a recognition of the need to transform that skill system, and that I understand is underway. Employers must form a core part of that activity.

Q446 **Douglas Ross:** I do not want to put words in your mouth but I just want to check for our own evidence. Do you accept that there needs to be greater investment by the Scottish Government into skills, as Fife and the City of Glasgow colleges have said in their written evidence to us?

Scott McClelland: I think that is right. A massive increase in skills is needed across this sector and other sectors, and investment is needed, absolutely.

Q447 **Michael Shanks:** It is good to see you both, and similarly, please pass my best wishes to the Minister for his recovery.

We hear quite a lot in the evidence that we have received in this inquiry about the place of SMEs in this industry. Do you think that is where Scotland's key place is with SMEs in the space sector? I suppose what I am asking is: do you think that is all our opportunity is or do you think we should be doing a lot more to grow the SMEs into being much bigger companies? We hear a lot about SMEs and how great they are—we have lots of SMEs—and of course they are. Is that the limit of our opportunity?

Scott McClelland: No. As you say, we are predominantly SMEs. That is not unique to the space sector. What that is great for is enabling innovation and change at speed. However I think there is absolutely a need and a willingness to grow a number of those companies into larger SMEs and into the middle size. I think there is also some opportunity. Scotland does not have, as you noted, core primes in this area. I think that hinders our ability in some areas to attract some of the larger opportunities, be that through the European opportunities or the more central UK side. There is a balance of a change in how the ESA and UKG might think about how they procure activity to move away from major primes, but also, I think in Scotland the situation of some primes would certainly help in freeing up ability and attracting larger contracts that can support further supply chain activity. It is predominantly SMEs just now, but I do not think that is the scope or extent of our opportunity.

Q448 **Michael Shanks:** I will come back to ESA because I have a specific question that follows on from what you were saying there.

First though, what more can the Scottish Government do to support growing these companies? We know that a lot of the big investment



funds are in London rather than in Scotland, but Scotland House is in London specifically to try to encourage that networking between SMEs and where the private equity is. Is more of a role needed in this particular sector to bring that investment to Scotland?

Scott McClelland: Yes. Again, I would say it is perhaps not unique to space, but space, like other deep tech sectors, is capital intensive and has long return times, obviously heavily regulated and involves new technologies that have more risk from a private investment base. But yes, we need to do more to work with existing investors and new investors to bring that activity into Scotland and that is something that the UK Space Agency also recognises and wants to do in partnership with us. There is more that can be done there. There is activity through our inward investment and trade colleagues as well, looking at what capital investment changes can happen on that side.

Rory McGregor: The Minister probably would not mind me recognising the fact that he has recognised that himself when he was out in Los Angeles last October. He had a meeting with members of the VC community out there to try to show the flag for the ecosystem in Scotland, so it is recognised.

Q449 **Michael Shanks:** Foreign investment into the space sector in Scotland: we had some evidence that there is an element of displacement when some of that investment comes in terms of the skills that are in Scotland, particularly those higher paid jobs in the sector, that there are not enough people to fill jobs in various companies. I will ask specifically about Mangata in a minute, but that was one example of where there was some evidence that people were just being poached from one job to another. Far from it being new jobs, it was just the same people moving to a different company. Have you any reflections, maybe linking slightly back to what Douglas Ross was asking, on how we grow the skills base more generally, so that there is opportunity for people in these higher level jobs?

Scott McClelland: There is an aspect around awareness and understanding of the opportunities in the sector that will support more young people to enter the sector, but also support a transition from adjacent sectors into opportunities within the sector. Activity and opportunities like Mangata help to raise the profile of Scotland. It is extremely disappointing that it has not worked out.

To grow the sector, the people need to know that there are opportunities within the sector, and that is going to take a mixture of inward investment that will drive competition and growing our indigenous base. The same argument was probably used around the attraction of Spire, and that has turned into a fantastic success story for Scotland.

Q450 **Michael Shanks:** I appreciate that this is not a question for official levels, but in a number of answers you have said more needs to be more done, that there does need to be more investment and more focus. At



what point do we start to see the fruition from that, Particularly in skills? We have been hearing from colleges and universities for months now, and they have been making the case for years, that they have the capacity and the capability to upskill in these new industries but they just do not have the resources to do it. That goes back to the Scottish Government. I do not know if you would add to that, but I appreciate that is a policy question rather than a civil servant question.

Scott McClelland: Yes. Sorry, I do not think we could give you an answer.

Q451 **Michael Shanks:** We will put that to our Minister, perhaps.

Can I go back to the point you raised earlier about ESA? Scottish headquarters companies get, I think, around 4% of that funding. What role can the Scottish Government play to encourage more of that funding to come to Scotland? Is there a mechanism to encourage more of it or is it more difficult than that? What is our scope to encourage an increase?

Scott McClelland: It is slightly more difficult in that we do not have that direct relationship with ESA, which is of course through the UK Space Agency. However, the UK Space Agency recognises that figure and wants to do more about it as well, so we can work in partnership with the UK Space Agency and industry to see what we can do to raise that figure.

Q452 **Chair:** One of the things that was encouraging to us when we visited the US and spoke to several figures in the space sector was the knowledge of the Scottish space sector. I think they actually recognise that we have significant presence and that we do very well when it comes to small satellites and data acquisition.

Do you link up with Scottish Development International to try to ensure that we get into the faces of the big players when it comes to the US particularly, and try to encourage them to look at Scotland? Because what we heard, particularly around the Bay area with a lot of this activity, is that they are looking for places to branch out because activity is so expensive with real estate and the cost of being able to get a workforce, the higher wages and living costs that are associated with that. How do you make sure that Scotland is put in the frame as a place to come to and invest?

Scott McClelland: Yes, absolutely. As you mentioned, SDI are that front door to that. We work very closely with SDI to make sure that they are aware and able to represent what is going on in Scotland. We have also worked with our colleagues in the embassies to support showcasing Scottish talent and activity. Scottish Enterprise is again looking at what activity we can do, specifically in different parts of the US, to look at R&D collaborative activity with companies in the US. Of course, the Minister has been very much a strong advocate for the industry in going out and presenting on what the Scottish sector has to offer.



Rory McGregor: SDI is also a standing member of the Scottish Government space group, both on the inward investment side and the trade and export side.

Q453 **Chair:** Another concern is that companies becoming successful in Scotland, possibly on a smaller scale when it comes to the European market, being tempted and encouraged to relocate and resettle in the United States and access to a bigger market in much more of a mature sector and industry. Is there anything that you feel that we could usefully do at an official level to retain them, to support them in Scotland and make sure they continue to be a presence in our community?

Scott McClelland: I think it is fair to say that a lot of them look at that market, first at the size of the market and, secondly, the availability of capital to support growth. We are looking at how we work with industry to tackle a number of the areas that they have noted as holding back or prevent future growth—access to capital, infrastructure, and those kinds of things—trying to solve some of those current challenges while recognising the benefits of operating within Scotland, that close-knit ecosystem to help shape and drive activity as well as working with colleagues at the central UK level to support access to other markets across the European avenue.

Q454 **Sally-Ann Hart:** Good afternoon to our witnesses. I am going to go back a bit to take up something that my colleague Douglas Ross raised about skills being a devolved area for the Scottish Government while space is reserved—that mix. If I am right, you said, Mr McClelland, that the New Market Clusters Unit does not do much about skills. Is that right? Could you explain that a bit more? How do you look at the new market clusters in the space sector without looking at the skills as well? How do you deal with that?

Scott McClelland: There are skills policy areas that have overarching responsibility for setting the direction and policy for skills in Scottish Government. That sits outside of us. We engage with the industries in our respective areas to try to understand what is needed and what the challenges they are seeing to be able to feed that back into the central skills policy mechanisms.

Q455 **Sally-Ann Hart:** So, looking at the industry, the Space Skills Alliance said the skills gap is especially acute for SMEs. Space Scotland has voiced concerns that currently the onus is on industry to provide and fund training, which is a significant burden for SMEs. How would you respond to that? Is that what you are hearing from SMEs?

Scott McClelland: That reflects what we hear from industry as well.

Q456 **Sally-Ann Hart:** What do you propose should be done to ease the burden on SMEs for skills training from your point of view in the New Market Clusters Unit?



Scott McClelland: One of the challenges is around the current numbers within the sector. It might not be as strong to change a wider direction. One of the things that we are trying to do across New Market Clusters is to aggregate what that demand looks like with a greater understanding and a greater critical mass around it. It gives us more ability to influence internally, to shape and change the central policy, central skills, policy directions.

Sally-Ann Hart: That is the Scottish Government's central skills policy?

Scott McClelland: Yes.

Q457 **Sally-Ann Hart:** Does the policy need to be improved to meet the needs?

Scott McClelland: I think it is recognised that the system does need change. A review is under way looking at transforming the skills system.

Sally-Ann Hart: Mr McGregor, do you have anything to add?

Rory McGregor: No, I think Scott covered it very well. There is a directorate that is devoted to skills policy within the Scottish Government. We are right in the middle of a quite serious, transformational change of the skills delivery landscape for Scotland.

A review was undertaken by James Withers. It reported—sorry; central skills is not my area, so my dates will be fuzzy, but I think it was about a year ago or something like that. The response to that was the end of last year, and I think they are now moving towards the structural implementation side of things in the next steps from there. There is a big change coming to the landscape.

Q458 **Sally-Ann Hart:** Mr Ross mentioned the Fife and City of Glasgow colleges who told us that access to space careers is often predicated on having a university degree, but further education colleges could play a greater role in meeting the skills challenge. Do you agree? From the New Market Clusters Unit point of view, how could you support FE colleges to do that?

Scott McClelland: I think we recognise that, absolutely. Across space—and some of our other areas as well—there is a perception challenge that we need to tackle. It is perceived that people need a PhD in astrophysics or quantum theory to be able to work in these sectors but that is absolutely not the case.

We need to provide a support to better educate and inform about the opportunities that are coming within this sector, which will spread across a variety of expertise. Obviously, we will continue to need specialists with PhDs but opportunities exist all the way down to technician level. There is a lot of activity there that we will need to do in conjunction with industry and our academic colleagues in order to understand what those pathways are and support activity.



Q459 **Sally-Ann Hart:** In education pathways, have you heard of the Baker Dearing Trust and university technical colleges? They have university technical college sleeves aimed to expand vocation and education within existing mainstream secondary schools. They replicate UTCs, including employer-based projects that develop skills including employability skills, and they aim to enhance vocational education. You should have a look at that; it is very interesting.

If we want to be one step ahead, we have to start earlier than further education colleges. We have to start right at age 14 or 13. It is something that all of us, the UK Government and the Scottish Government, need to focus on, getting in early and having an education pathway that leads to employment. Is that initiative worth looking at?

Scott McClelland: We would certainly be happy to explore.

Sally-Ann Hart: Interesting. Thank you, no further questions.

Chair: Wendy, did you conclude your questions?

Wendy Chamberlain: Yes, I did.

Q460 **Chair:** We heard from the CAA in the previous panel. Can I ask how you work with the CAA and other bodies to ensure a joined-up approach to space regulations and what are the particular challenges in doing so and trying to achieve that?

Scott McClelland: Yes, we have semi-regular engagement with the CAA to understand what is happening and to understand the feedback that we are receiving from industry, to feed back in that sense. I think the relationship is strong and we have met with Colin, and the Minister has met with Sir Stephen on numerous occasions. I think that works well. There is obviously, as Colin noted, a balance between making sure that CAA remains that independent regulator outside of our side. We have absolutely no complaints around the relationship with CAA and I think that is echoed in what we hear from industry.

Q461 **Chair:** We have heard that the Scottish Government's marine directorate was not set up to process marine licence applications for spaceports. How are you supporting the increasing number of applications that are coming forward?

Scott McClelland: They weren't, but they use an existing licence that they are comfortable with processing. It is the same journey that the CAA has gone through, building up capacity, seeing more applications, and they will become better at it and processing times will improve.

Something to reflect, of course, is that the marine directorate is responsible for licensing other marine matters. I think that in the last 12 months there has been one space licence compared with hundreds for offshore wind. Resources need to be prioritised accordingly. As we start to see a ramp up in the space area, I am sure we will see movement around more resource to support that activity.



Q462 **Chair:** We are about to hear from the UK Government about their space strategy. How often would you meet up with your colleagues, the UK Government, who are doing roughly the same type of activity down in Whitehall?

Scott McClelland: It is fair to say that our engagement with our UK Government DSIT counterparts has not been as strong. I know they have been through a number of changes. We have tended to be more strongly linked with our UK Space Agency colleagues, but we certainly welcome greater engagement going forward.

Chair: Maybe we could gently encourage them to come and speak to you a bit more about the number of issues that you obviously explored with us today.

Thank you both ever so much. I think you have heard the sincere best wishes from everybody in this Committee to the Minister, and we sincerely hope he gets better soon and see him back on his feet in Parliament. We will just have to suspend for a few minutes now until the Minister is ready.

Examination of Witnesses

Witnesses: The Lord Cameron of Lochiel and Dr Paul Bate.

Q463 **Chair:** Welcome back to the Scottish Affairs Committee and our third session of the afternoon. We are delighted to be joined by the UK Government in the guise of the new Lord Cameron of Lochiel. Welcome to this Committee; we hope to see much more of you in the future. You are joined today by Dr Bate, who is the chief executive of the Scottish Space Agency. What we will do is allow you to introduce yourself and anything by way of a short introductory statement.

Lord Cameron of Lochiel: Thank you, Chairman, for that warm welcome. I am delighted to appear in front of your Committee, and will, as you have just said, be assisted here by Dr Paul Bate from the UK Space Agency, who hopefully will be able to cover off any technical issues that I am certainly not qualified to speak to.

I would like to say a couple of things in opening. The first is that there has never been a better time in my view and the Government's view to start and grow a space business in Scotland. There is clear local and national support, funding opportunities and advice available. I would also say that I think Scotland is punching above its weight when it comes to space jobs in the UK. After London and the south-east, there are more space jobs in Scotland than anywhere else; 18% of all UK space jobs are in Scotland.

I would also like to say, Chair, that I think this is an area where the UK Government and the Scottish Government are very closely aligned in terms of their strategic objectives. We are all used to areas of dispute between the UK Government and the Scottish Government, but I think



that on space, there is an absolute alignment of interest and support. In the short time that I have been a Minister, I have seen, both at official level and more widely, that sense of collaboration, not just between the two Governments but also between the hugely complex but varied sector, that exists in terms of the private sector, academia and research. With those opening points, Chair, I will leave it there.

Q464 **Chair:** Thank you so much. We were, of course, expecting to be joined by an official from the Department of Science, Innovation and Technology, and were only informed on Thursday that she would not be available to us. This followed the unavailability of Minister Griffith, who we understand is busy travelling, but we are disappointed that we could not hear from DSIT, when it comes to such support issues such. However, we are grateful for your opening remarks.

Maybe I could start. You are absolutely right that what we found in this inquiry, which we have now almost concluded after several weeks, is that Scotland does have excellence when it comes to the space sector. We are way ahead of the game when it comes to small satellite production and data acquisition and retention. We have a very thriving industry. What is your particular vision to grow that sector? What do you see as the way forward to make sure that not only do we retain our current situation and position within the European sector, but perhaps grow and progress it even further.

Lord Cameron of Lochiel: The first point to make is to highlight the importance of launch, if I could put it like that. You will be well aware of the plans for SaxaVord in Shetland and for the spaceport in Sutherland, which will hopefully come onstream next year.

I think that is a hugely important part of UK Government policy. The reason for that is that Scotland can already do a lot of the upstream commercial satellite production that you have referred to—small satellite production in places like Glasgow—and a lot of the downstream work, such as data collection, data analysis, through the work of our universities in Edinburgh, Glasgow, Heriot-Watt. However, the one thing that we do not do yet is launch and that is, in effect, the missing piece of the jigsaw. As you will know, the Government committed £10 million to SaxaVord in the Spring Budget. It is such an iconic part but it is an absolutely critical part of the space sector in Scotland. Ensuring that it goes ahead is one of the foremost things we can do.

Q465 **Chair:** Of course this Committee did visit SaxaVord recently and I think we are very impressed with the progress made. We were all quite excited about launch being able to come to Scotland and as we have heard earlier it would complete the full range of activities from Scotland.

What do you say about the concerns about the UK's space strategy? Like so many strategies that we get from various Governments, and I am not just saying the UK Government, it is all there with ambition of what they hope to achieve but it is perhaps a little bit more woolly on the details



side of things. How do you respond to that type of criticism, that it is great in aspiration but not so detailed when it comes to exactly what it is going to do?

Lord Cameron of Lochiel: It is a high level document. It delineates the various ambitions in quite wide and general terms and it is also almost three years old. I would say, Chair, that it must be read in conjunction with the two government documents that have followed on, namely the national space strategy action document that dates from July last year, and the space industrial plan, which was published in March. I think that gives certainly more detail and more specific pragmatic policies that perhaps we could come on to later.

Q466 **Chair:** We most definitely will and you are right that the industrial plan does include that further detail but with the other strategy there is not all that much more. I am interested in the view of Dr Bate who I think had a part in bringing forward these documents. What do you feel about that criticism? It is like so much was seen in this and it is great in ambition, and we like ambition, but where is the detail about how we achieve this?

Dr Bate: The document that was published in September 2021 came out just before the spending review when the Government needed to make their decisions on spending. I do not think it would have been appropriate to put the money into a strategy document at that time, but what followed, as the Minister said, were subsequent documents and the comprehensive spending review that set out funding including the funding for space over the following three years alongside the UK Space Agency's corporate plan. We do not have the sole locus for delivery against the national space strategy, but we are one of the main delivery bodies and we were able to go into significantly more detail across eight separate priorities under space consistent with further space strategy but in each case costed annually and over the three years. We have been delivering on that since.

Q467 **Chair:** A lot of the activity in Scotland is by small and medium-sized enterprises. This is probably a question for the Minister. Are we confident that the voices of SMEs and Scottish space companies are being heard clearly enough in Westminster?

Lord Cameron of Lochiel: We are confident, Chair, that they are being heard. As I am sure you know from the evidence you have already gathered, of the 1,600 or so companies operating anywhere in the sector, the vast majority are small companies. That is also true in Scotland. And it is true to say that they have flourished—small to medium-sized companies such as Spire Global and Clyde Space in Glasgow, satellite producers. However, UK Government policy is to try to not only allow them to flourish but also to help them. The Space Clusters Infrastructure Fund, which I am sure Dr Bate can speak to as well, is an example of the UK Space Agency contributing I think £47 million to a fund that has helped a company in Dundee, Smiths Interconnect by contributing £1.9 million to that company. That is a smaller company.



There is undoubtedly more to be done. An important point is that seed funding in earlier rounds was less focused than perhaps it could have been. I think there is a realisation that in later rounds there could be potential for a lead investor to be chosen to be funded upon which smaller companies could piggyback. We are keen to see that kind of innovative thinking.

Q468 **Chair:** I would be keen to hear from Dr Bate about the £47 million of funding. Is it enough to satisfy the demand that we have from the SMEs in Scotland?

Dr Bate: I think that particular fund was four times oversubscribed.

Chair: Four times?

Dr Bate: Four times oversubscribed. It was the first time that we put a substantial amount of money into clusters and infrastructure specifically and I think we have shown just how much there is a pull from the sector right across the UK, because we are a UK space agency.

My previous job was growing as part of an SME and going all the way through to a flotation, so I recognise the challenge in getting people's attention, but I would say that it is not just about the voices being heard in Westminster; it is also about how much the space agency goes up and is part of the Scottish set of communities. When I am up there, and I will be up again in Glasgow on Monday, we talk all the time. I feel I know not least about the launch sector, about how Orbex have made their £16.5 million initial raise on their Series C, how SaxaVord spaceport is doing, how STAR-Dundee is doing and Spire Global and AAC Clyde Space and so forth. There are 183 companies and I am not saying I know them all, but I think their voices are heard clearly, which is also down to the likes of Space Scotland for convening the industry across Scotland.

You are absolutely right, although we do not have—and you have heard evidence about this—a large indigenous prime in Scotland, the growth in the sector and the growth in all high tech sectors typically comes from the SME base. The fact there is such a strong base in Scotland is positive.

Q469 **Chair:** Of course we have heard that Scotland only manages to secure some 4% of all the European Space Agency, funding, which given our population share does not match up at all. What are we doing to address that and to ensure that we get something more like our population share of the funding that is available through what is probably the biggest funder that we have available to us in space development?

Lord Cameron of Lochiel: Could I briefly answer that and then perhaps turn to Dr Bate?

I think ESA funding has been beset by two issues. The first is the cost of applying; secondly there is a difficulty of understanding the best way of bidding for ESA work. I think that is improving. The UK Space Agency is doing a tremendous amount of work with hubs and so on, giving bidding



advice to help companies. I think Dr Bate is probably best to outline what that is.

Dr Bate: Let me turn to ESA in one second. It is worth saying first that all the non-ESA funding, 15% of all that funding from the UK Space Agency, goes to Scottish organisations, but it is 4% or 4.1% from the ESA side. As the Minister laid out, having recognised that, even though it is for ESA, not for the UK Space Agency, to make the decisions on who is funded within the UK, those are the rules of the game and the best thing we can do to help is to support individual organisations to bid well, to be aware of what is available and when and the full range of different options, all of which we do from the Business Incubation Centre work, the free labs and so forth.

We are also seeing reasons for cautious optimism. In the last 12 months we have seen significant improvements and we can provide the Committee with that data. Since 2015 we have seen a 25% increase in the funding going through ESA.

Q470 **Chair:** That is encouraging because we are hearing about the wrong types of applications that seem to be coming from the Scottish companies. How do they get it wrong if everybody else in the United Kingdom seems to get it right?

Dr Bate: I would not say everybody in the United Kingdom always gets it right. These bids are competitive right across Europe and although we do sometimes win, we do not always win. In the rest of the UK there are sometimes larger companies. I can take one example but it is not the only one. Airbus UK largely in Stevenage and Portsmouth, will have larger teams that are perhaps more used to bidding into ESA and have more heritage and confidence or larger teams to support bids.

Q471 **Michael Shanks:** Thank you both for your time today. At the beginning Lord Cameron spoke about the UK Government and the Scottish Government being closely aligned on strategy. On a practical level, do you think there are ways the two Governments could work better together?

Lord Cameron of Lochiel: I think there is a lot but it is worth acknowledging what is happening already.

On a practical level a good example of this is launch, where you see a Scottish Government agency, Highlands and Islands Enterprise, contributing to the launch side the local knowledge that is required and you then have the UK Government in dialogue with the commercial companies involved. That is a good example of the UK Government and the Scottish Government dovetailing, one perhaps having a wider commercial relationship and the other using local knowledge on the ground to help. There are other examples of collaboration. The UK Government co-funds Space Scotland. There has been collaboration over the Space Workforce Action Plan. There has been collaboration over the



regulatory review, so there are practical examples of collaboration happening on the ground.

In light of this evidence session, I have asked my officials in the Scotland Office to set up a roundtable in Edinburgh, in Queen Elizabeth House, where the UK Space Agency will soon have a place to work from and that roundtable would, I hope, see Members of the Scottish Government both at ministerial and official level, the UK Government, the agencies involved and the wide ecosystem of commercial companies and research and academic institutions come together and I would welcome any members of this Committee who want to come.

Q472 **Michael Shanks:** That is a positive outcome before you have even published the report. That is fantastic.

I suppose an issue like this it is an emerging issue within government that has not been thought about in the past. We have the Ministry of Defence involvement, the Department for Transport, the Department for Business and Trade, the Department for Science, Innovation and Technology, the UK Space Agency, Civil Aviation Authority, UK Research and Innovation and that is just in the UK Government. Some of the evidence that people have given us is that there is nobody in charge and that although there is on paper a space Minister, the Minister for Science, Research and Innovation, lots of people take different responsibilities and the co-ordinating of it all is something that Government could improve on. Do you think there is something more the UK Government could do to take a cohesive ministerial responsibility for this or is it inevitably splintered between different parts of Government?

Lord Cameron of Lochiel: I think it is the latter, to be fair. It is a very fair question. I think the point is that space itself is a relatively amorphous concept and that filters down into Government. Responsibility is dispersed because of its very nature, but I think it is also right to say that the UK Government are trying to drive activity across the various Departments involved. It is just very difficult to compartmentalise it into one Minister and one portfolio. As you will be aware—

Q473 **Michael Shanks:** Do you recognise though that people say to us that what that means on the outside is that they do not know where to go in Government, and that there is no clear route through? If you are a Scottish company, do you go through the Scotland Office? There does not seem to be anyone that is in charge of, for example, launch in the UK. Who is the Minister that is the go-to person?

Lord Cameron of Lochiel: I would not doubt any of the evidence that you have heard but as I say it is very difficult to compartmentalise it. There is a defence element to space, you have DSIT running civil space policy. Under that you have the UK Space Agency working on delivery of programmes and then DfT and the Civil Aviation Authority who are responsible for regulation. I take your point that perhaps there could be



better mapping of the governmental system, but ultimately it is just very difficult to pin it down.

Q474 **Michael Shanks:** Dr Bate, some of the evidence we have heard, particularly in Scotland, is about the role of SMEs in the sector and how important they have been, particularly around innovation and particularly some of the university spinouts and so on. What more do you think we could do to encourage those companies to grow beyond being SMEs into being some of the bigger players in this market? Do you think Scotland has potential to host some of those bigger companies?

Dr Bate: Yes. At the moment there is £180 million of revenue and 183 companies so you can see that the average amount of turnover per year is relatively small. It seems that in addition to the things that we are already doing by way of supporting through grants, R&D and the ESA workshops that we have discussed, ultimately having a strong customer base and a strong investor base is what will drive those scale-ups to go from SMEs to the next stage and onwards into really big revenue and profitable businesses.

One of the programmes that we run at the agency now, which is called Unlocking Space for Business is to take the opposite view to the traditional, "How do we just support the R&D of the space sector?" and look at it and ask, "What do financial services and the transport sector need from space and where are we seeing barriers to them working well together?" I think it is important that we continue to fund those sorts of programmes as well.

Q475 **Michael Shanks:** One of the things we have talked a lot about is skills in this sector, which of course is devolved to the Scottish Government. What do you think we could do on a UK basis to improve the understanding of the skills you need and the qualifications you need? This is something that Sally-Ann Hart has focused on in earlier sessions, breaking down the idea that you need to be PhD qualified to get a job in space. That could be a UK-wide initiative, particularly getting into schools at an early stage. Is there anything more the UK Space Agency could do to support that work?

Dr Bate: There is nothing wrong with a PhD.

Michael Shanks: Absolutely, Dr Bates.

Dr Bate: But you are absolutely right. I think 77% of people in the space sector at the moment have a primary degree and we do need to break down some of the barriers of people thinking it is only for people who want to be an astronaut or astrophysicist. We start at around the age of 11 and work our way up. We have a programme that is called Space2Inspire which is literally that, to help people to understand just how exciting space is. We took our replica rocket on a UK tour of 13 different sites including Aberdeen and Glasgow, precisely so that people



could become more aware of what the space industry really is, everything from the design side and the marketing and communications and finance.

We also invest right throughout the secondary curriculum in a Space to Learn programme, and these are substantially bigger programmes than they have ever been in the past. The one thing we are very clear about here is that while it is absolutely lovely to go into a school, particularly if you bring badges and pens, we know the evidence says that it only creates value if these are part of ongoing programmes embedded in the curriculum. So we work with the STEM Learning centre, we work with ESERO-UK to ensure we are skilling up teachers to be able to teach the STEM curriculum through space, for example. Then as we work more into the skills agenda for people who are about to go into the field or perhaps are in an adjacent field but could come in, there we look at things such as space internships, or spinternships, of which I think there are 130, and 30 of those are in Scotland.

We are trying to build up those stepped elements, taking in everyone from a 10 year-old in Dundee or a person already all the way through to thinking about what the choices are now they have their degree or apprenticeship. We are crying out for RF engineers, systems engineers, software engineers, and finance people, HR people and design people. So 49,000 is not a bad start for the number of people employed across the UK in space but there is so much more that we can do with people.

Q476 Michael Shanks: Some of that sounds really good and exciting and as a former teacher I can say it was always great when people came in to entertain your classes with pens and whatever else. On the space workforce action plan, there has been some feedback during this inquiry that maybe it does place too much emphasis on the rockets and the astronauts and that aspect of things, which creates maybe a misleading idea that that is what a job in the space sector would involve, rather than the full diversity of jobs available in the sector. Do you recognise that criticism? Is there anything you might do differently?

Dr Bate: I absolutely recognise the criticism. I also think that for some people, that is the moment of inspiration for them. The trick is not to have just one thing, that we do not just invest in the replica rocket but look at the range of things that might excite people about space. We will talk in the curriculums about what it takes to mitigate the climate emergency through using satellite data. We have recently just had the final of something called the CanSat programme which is for 16 year-olds or thereabouts in any school across the UK to compete to launch a very small, can-sized satellite up into the atmosphere and then take data from it. Their interest might be about photographing their school or the local environment and seeing how that might work for planning in the future. There are multiple touchpoints.

Q477 Michael Shanks: One final question about the Space Agency. In 2021 you will recall the Civil Service People Survey found that there were extremely high levels of bullying within the organisation—I think the



highest level of bullying of any part of Government. In fact one in five reported experiencing bullying. A review was launched after that. Is there any update on progress towards improving that situation?

Dr Bate: Yes, absolutely. Levels of bullying were, and remain, much higher than it should be because we do not tolerate any. In the most recent staff survey results the amount of reported bullying and harassment dropped by over a third, which we are pleased to see, but as I say it is still too high. Another thing that I think we can draw some encouragement from is that in the year of the survey that you referred to, across all organisations, just over 100 Civil Service organisations, the number of Space Agency staff who did report bullying and harassment was relatively low down the rankings—around 80th—for whether they would feel willing to report that formally. It is one thing to say it in a survey; it is quite another thing to feel confident and safe enough to report it to HR. However, that has now changed so in the Space Agency reports we are the second most likely organisation, our staff say, relative to other organisations, to feel safe to report. That is what we have been working on in the two and a half years I have been in the job, the safety to bring yourself to work and if something is not right to be able to speak up about it.

Q478 **Chair:** Just before I bring in Douglas Ross, I'd like to raise one issue around skills. It comes from some supplementary evidence we have received from the CEO of one of our most important Scottish-based companies, Alba Orbital, and it is the concern about the removal of design engineers from the skilled worker visa list. What they are telling us is that they might have to start hiring engineers in Germany instead. Would it be something that would be considered, that we get satellite engineers or those types of skills back on that list, given that this is a developing sector that needs that specific skill and talent?

Lord Cameron of Lochiel: I can certainly relay that to the Department, Chair. I think I am right in saying, that the new ISL is open to review during the year and I think it would be important for any company or organisation involved to contribute to that. It is very important from the Government's perspective to hear from companies, employers and so on. I think I am right in saying that those figures are set by using median earnings in the various categories and the reason for that is that it is seen as a fair way to set an earnings level. I imagine—

Chair: The figures are that it has doubled from £27,000 to £50,000 for minimum salary. That is a massive increase. I think this is a genuine plea from one of the space companies and I am encouraged that you will have a look at this, because I am pretty certain that when we come to compile the report, this will be a feature. Skills have been such an important issue. Sally-Ann Hart, as Michael Shanks has said, has been raising this consistently and obviously we want to do everything that we can to support the sector. Thank you for that contribution. Douglas Ross.

Q479 **Douglas Ross:** Good afternoon, Minister and Dr Bate. Minister, it is good



to see you at Committee in your first appearance. I am sure you will be a regular attendee here at the Scottish Affairs Select Committee.

Lord Cameron, in your previous role as a Member of the Scottish Parliament, you represented a region that is now critically important to the launch of these satellites, looking at Shetland and Sutherland. Before you came into your ministerial role, how did you view the impact this would have on communities? I am thinking about Unst being an area very far north and the more traditional industries up there. How much has this investment and the increase in activity having an impact on the local communities?

Lord Cameron of Lochiel: Thank you very much for your welcome. Having in a previous life stood as a parliamentary candidate for Orkney and Shetland, admittedly almost 10 years ago, I am acutely aware of the importance of these kinds of industries generally. These are very remote, very rural communities, and investment such as this is a gamechanger for them. It brings in—and not just during the construction phase—a huge number of jobs, most importantly, but also investment, interest in the area. As someone who is very proud to have represented the Highlands and Islands for eight years in the Scottish Parliament, I say that it is an absolutely tremendous achievement for all those involved. That is why HIE contributed what it did—HIE is the principal development agency of the Scottish Government—and it is also why the UK Government have supported it. It is a sign I think of both of Scotland's Governments recognising that.

Q480 **Douglas Ross:** Do you accept as well that there are other infrastructure challenges that come with the development, be it at Sutherland or at SaxaVord and there will have to be some emphasis placed on upgrading some of the critical infrastructure? I know there is certainly a campaign to have tunnels from the Shetland Isles out to Yell and up to Unst. Will that be an important part of the process for both of you? I think the UK Government have been asked and the Scottish Government in terms of matching the local infrastructure for what will be nationally critical spaces of expertise with the launch plans.

Lord Cameron of Lochiel: Absolutely. Critical is the word to use. The necessity to upgrade the transport infrastructure, telecoms, the gamut of different types of infrastructure not only that locals rely on anyway but the investment and the infrastructure that is being created through the space sector, is absolutely fundamental.

Q481 **Douglas Ross:** Dr Bate, you spoke earlier about the engagement you have in Scotland, and you are up in Glasgow next week. I asked this question earlier. How does the Scottish space industry at the moment compare to the industry elsewhere in the UK and indeed around Europe and across the globe? We are the leading producers of small satellites—I think we produce more in Scotland than the rest of Europe combined. What areas is Scotland doing particularly well in and what areas within the space sector do you think Scotland maybe has an opportunity to go



even further?

Dr Bate: We look at three particular areas of strength: the small satellite design and manufacture; the downstream data and application side, particularly based around Edinburgh; then the launch sector, in Sutherland and SaxaVord in Unst. However, we then see other companies that may not be in those areas but still have these opportunities to do really well. I can take the example of STAR-Dundee who do something called SpaceWire and SpaceFibre which is on board the satellite doing the data networking, the IP course. The standard SpaceWire has been adopted by the European Space Agency. When you think about how many satellites are being built by the agency you can see how that could be a growth area. They have great respect in the global community.

While I think those three individual subsectors are all important, and all showing growth, it is by no means just about those areas. I always think it is good that we know where there is already strength, but we must create the ecosystem where anybody with a good idea can feel the opportunity to grow and get the support as well.

Q482 **Douglas Ross:** You have both mentioned launch—indeed, Minister Cameron, that was your starting point for your contribution here, and Dr Bate has just reiterated that. Obviously, we have had a launch already in England that was not as successful as people had hoped and potentially one in Scotland quite soon. How well do we prepare the public and to a lesser extent decision makers, because they are involved in this, that there will be a large element of failure in space and particularly in launch, and do you think we have the messaging right that if it is not 100% successful, albeit it must be 100% safe, the first time from SaxaVord or from Sutherland there are so many other opportunities? Do you think there has been enough work done for the public to understand that a failure brings many successes with it, because people understand better what they have to improve on for the next, hopefully successful, launch?

Dr Bate: I think the Virgin Orbit launch from Newquay in Cornwall showed that we had laid the groundwork. Although there was huge disappointment I think across the country and across the sector, the fact that we could get the message out that space is difficult, that we see this in countries around the world that have had recent launch failures, part of getting into space is how complicated it is. It was not seen as some unmitigated failure, never to be repeated.

I think it is very important that we did not invest in one sole space port, but instead had a competitive approach to our launch programme from the very start. There were seven space ports for example across the UK. Looking at the ones that the Space Agency has funded, particularly the launches for, that includes both the Orbex launch from Sutherland likely next year and the Lockheed Martin launch with ABL from SaxaVord also next year. That is important too so that we are not putting all our eggs into one basket or into one rocket because we are not talking about SpaceX which has gone through their failures and on their Falcon



programme now launch around twice a week, but they have had three recent starships, each of which have achieved something—we have a lot of data from them—but have not all been successful yet.

Nonetheless there are companies, whether that is Orbex, Skyrora or indeed the other companies such as Rocket Factory Augsburg that will launch from SaxaVord hopefully later this year. They are in their very first launches so we should not expect a 100% launch record.

Q483 Douglas Ross: To go back to some of the areas that Scotland has up until now certainly led the way in, particularly the development and the production of small satellites. We heard when we were in the United States as a Committee looking at this as one of the inquiries that we were taking evidence on that there is a shift away from the smaller satellites to larger satellites, partly due to the reduction in the cost of getting the larger satellites into space. Is that a trend you see and does that then lead to a potential threat for the Scottish sector, which has invested quite a lot in the production of smaller satellites?

Dr Bate: I would expect to see the market for cube satellites to continue to grow—

Q484 Douglas Ross: In size, or—?

Dr Bate: Sorry; the market for cube sats to continue.

We are seeing certain subsectors—for example, the communications sector at the moment—move towards to larger satellites. They have had the really big ones in the geostationary orbits but we are now seeing more like the 150 kilogram-plus satellites in those mega constellations, whether that is OneWeb or Starlink or Kuiper. That is very different to the earth observation sector where the cube satellites can be very valuable. I think we will see so many different use cases for space now that they are growing. There is more than enough room both for the cube satellites and for the larger size of still small satellites.

Q485 Douglas Ross: If you were giving advice to companies would you say to stick with what they are doing with the smaller ones or to incorporate this move towards some of the larger ones as well? Do you see the trend ultimately moving away from the smaller ones or will there always be a need for what is being produced in Scotland and is world-leading at the moment?

Dr Bate: I would not give advice to say get out of cube satellites and get into 150 kilogram-plus satellites. I would go the other way and say, “What are your capabilities, where have you invested and what is your customer pipeline?” When I have conversations with Spire Global or AAC Clyde Space for example, those are the sorts of conversations we have. I was looking at Spire Global’s share price over the last year. That is stable or slightly growing, so the market suggests that they have a viable future; it is a \$300 million market cap organisation.



Going back to the earlier question, what unlocks the real value is the recurrent contracts and the investment, so that is where I would start the conversations.

Q486 Douglas Ross: Minister Cameron, we have spoken about skills, and indeed in our earlier session I was encouraged to hear that the Scottish Government believe that there should be more investment. We heard from our witnesses that there needs to be more investment by the Scottish Government, and that is an area that is devolved to them.

An issue in terms of wider employment is what people do when they leave various sectors. Do we need to do more to tap into not just young people at school and what they choose to do at college or university but also people transitioning? Orbex is based in Forres in my constituency. Certainly in the early days a lot of the staff that were employed there had built up a considerable amount of experience in the military, either at RAF Lossiemouth or at Kinloss Barracks. Could the UK Government be doing more to promote that movement from careers where some expertise has been built up but would be very well suited to being involved in the space sector?

Lord Cameron of Lochiel: Certainly. Any discussion of skills should always involve the issue of reskilling as well as upskilling. That is a fundamental part of what we call the skills agenda. That is as true for the UK Government as it is for the Scottish Government.

It is worth recognising what the UK Government are doing already on a much wider scale, not just in terms of space but in STEM in general. I would point to a roundtable that my colleague John Lamont held in January this year in Edinburgh that involved STEM, trying to promote STEM within Scotland, which industry leaders and academics and so on attended. STEM itself is a priority of the Prime Minister and the UK Government more generally. I could point to the UKRI STEM ambassador programme, which is hugely important as well as the Turing Scheme, which has been set up. I think there is a recognition not just in terms of skills in the space sector but more widely that we need to do a significant amount to help.

Q487 Douglas Ross: Finally from me, one of the other challenges that we see in Scotland is decisions by the Scottish Government to make Scotland the highest-taxed part of the United Kingdom. That is having an impact on recruitment and certainly retention in some sectors. We heard earlier that certain jobs within the space sector are particularly well paid to encourage the best people to come. Is there a risk, Minister Cameron, that if Scotland continues to have this reputation of being the highest-taxed part of the United Kingdom that we will struggle to recruit the best and the brightest to come to take these highly paid jobs?

Lord Cameron of Lochiel: There is a risk and the increasing divergence of the two tax systems is creating that. That is a risk that I have just as a



Minister in the last few months had people talk to me about in terms of different sectors and in terms recruiting and retaining. It is a clear risk.

Q488 Sally-Ann Hart: Good afternoon to our witnesses. I am going to go back a bit to skills because we all know there are huge skills gaps. While the Government are doing a lot to try to deal with them, with the focus on STEM subjects and the Prime Minister's maths focus to try to get everyone up to scratch for the future jobs in AI and the space sector and so on, both Governments are a bit reactive to the skills need. They need to be one step ahead; they need to be three steps ahead. Dr Bate, you mentioned Space2Inspire and the rocket tour—thank you. They came to Hastings and it was fantastic to see some of our children dream about future careers, not just as astronauts but in the whole space sector, whether it is nursing, tourism or whatever else is there. The space sector is much bigger than just being an astronaut or having a PhD in particle physics—I do not even know what that is.

I mentioned to our witnesses, Mr McClelland and Mr McGregor, who were here from the New Market Clusters Unit about university technical colleges—Lord Baker with the Baker Dearing Educational Trust are very successful and there is an initiative called the UTC Sleeve that aims to expand vocation education within existing mainstream secondary schools. They replicate the university technical colleges, including employer-led projects that develop skills including employability skills, which aim to enhance vocational education so that you get that education pathway to get those new skills. Is this something, Dr Bate, that the UK Space Agency thinks is an initiative that needs to be explored more fully? Then over to Lord Cameron, is that something that you perhaps could discuss with the Department for Education and maybe Lord Baker himself? Is it the sort of initiative that we need to think about, going back and starting people earlier, getting them an education pathway and having the skills to fill those jobs, so we are thinking ahead.

Dr Bate: Wholeheartedly yes.

Q489 Sally-Ann Hart: Okay. Can we do it?

Lord Cameron of Lochiel: I am more than happy to take that up. It is a UK-wide issue. In a survey last year, 52% of respondents said that they did not have the requisite skills.

Sally-Ann Hart: Exactly.

Lord Cameron of Lochiel: Dr Bate will correct me if I am wrong, but I think there are particular issues in software engineering and electronics, as well as the highly specialised spacecraft operation jobs.

Another thing that emerged from that survey was, I think I am right in saying, that about half of the respondents also said it is very hard to predict what jobs will be needed in the sector in, say, three years' time.

Sally-Ann Hart: It is changing so quickly.



Lord Cameron of Lochiel: It changes so quickly and that goes to the point you have made about trying to prepare for that change in the knowledge that it is difficult to foresee where those jobs will be needed.

Q490 **Sally-Ann Hart:** Much earlier. Thank you.

I am going to go back to the space workforce action plan. I know Minister Griffiths announced in April that the plan should be published before the summer recess. Is it ahead? Is it on track to be published before the summer recess?

Lord Cameron of Lochiel: I have no further information than you. I am advised that it is due to be published before the summer recess and I have had no indication of any delay.

Q491 **Sally-Ann Hart:** Dr Bate, have you fed into it?

Dr Bate: Yes. And, yes, my understanding is it is due to be published before summer recess.

Q492 **Sally-Ann Hart:** Is it going to be good news?

Dr Bate: Anything that pushes forward skills in space is good news.

Chair: That is a very charming attempt to get an answer.

Q493 **Sally-Ann Hart:** Well, we like to hear good news. The Government previously told the Science and Technology Committee that they would establish a national space skills institute. Is there any update on that? Is that going to happen? Do we know what is going on there?

Dr Bate: I think we are likely to take the intent of a specific institute into the work that we do for the space for skills rather than have a separate institute per se. To give an example of that, one of the things that employers are coming back to us and saying is that not just do they have a gap, but they also have a gap in the training programmes. They can do a certain amount in-house but particularly SMEs want to see more training providers or more specific space skills, so the Space Agency is now moving to a programme of funding of certified providers where there is a clear pull from the sector base itself.

Sally-Ann Hart: I think the skills gap is something completely UK-wide. Hastings has some amazing space sector industries—vacuum engineering, precision engineering—and one of the things they talk about is the skills gap coming through and the cost of recruiting people. It is almost like a competition and it is very difficult to retain people because someone else poaches them by paying more. It is something we really must think about.

Thank you. No further questions.

Q494 **Michael Shanks:** Back to me again. I am thinking here about the Space Industry Act from 2018, which is being reviewed and it was due to conclude its review in April 2024. What do you think from that, for the



regulatory environment, are the key things that need to be taken forward now? I was reading the national space strategy, which has these four phases and it says we are out of the ignition phase and into the thrust phase. Do you think that is where we are, or do you think that is just what the strategy says?

Lord Cameron of Lochiel: In terms of the Space Industrial Plan that has just been published that is exactly where the Ministers involved say we are at. We are at the thrust phase from now up until 2030 and I think that is indicated by everything that is going on, especially in Scotland.

Going back to the issue of the regulatory review, which is incredibly important, and I think it goes to the initial question that Mr Shanks asked me, there is a need, given the amorphous nature of space and the fact that it is hard to compartmentalise it, to ensure that all the regulation surrounding space is effective, proportionate, and appropriate. I think that is why that regulatory review is ongoing and will be published in due course. It is also something that the Scottish Government have been invited to take part in.

Q495 **Michael Shanks:** That was going to be my next question. How much have the Scottish Government been involved in this? We had some evidence that the regulatory environment now has some bits that are in the Scottish Government's remit, particularly around the marine environment, and some parts, most of it, is still within the UK environment. In one particular example it was the marine aspect that was holding back one of the projects. How much, on a day-to-day basis, are the two Governments talking about trying to streamline those approaches?

Lord Cameron of Lochiel: It is certainly my understanding that the Scottish Government were invited to take part in the review, including stakeholder events in Edinburgh. How often there is more regular discourse, I am not sure. I do not know if you can assist with that, Paul.

Dr Bate: There are regular and frequent working-level conversations. As to what happens after the 2018 Act regulatory review, the intent is to publish before recess, around the summer. The world sees the UK as having world-leading regulation because of the 2018 Act and we are often asked, at agency level, by other agencies, to support them in similar endeavours, on the legislative programmes that they are involved in and the consequences of that. That does not mean that we are just sitting there.

In a consultation that we recently put out and we are now analysing responses from, one example that we knew about from industry was that having a variable limit on liabilities matters a lot. If a company can show that they have manoeuvring capability of their satellites, have a clear de-orbiting plan and are doing the right things, we want to be able to incentivise them. We want to have proactive regulation that means



companies would have to invest less on the insurance side. We have put forward proposals on that.

However, the truth is that global regulation is only there in part. There is the 1967 Outer Space Act and the UK was one of the three founding signatories, alongside the US and the Soviet Union at the time. As we go back to the moon and as we now look, for example, at returning samples from the moon and eventually from Mars, it is very important to maintain that leading position. That is why we hosted the Planetary Protection Conference the week before last, and we will look to continue to do that. We can convene people, so that not just our own industry is safe and anybody launching a satellite from the UK does so safely, but because it is a global commons at the end of the day. There is only so much metal that can be in a particular orbit and if we mess up the moon globally, it is messed up for a long time, if not forever. We are trying to have that global impact as well as to do the right thing in the UK.

Q496 Michael Shanks: The specific question I asked, though, was around the regulatory regime here in the UK. Of course you are right, it is a global issue, but if we do not even have cohesion within the UK on our regulatory regime it does not bode well for the global reach on this.

A launch has to go through a variety of regulatory aspects. A launch in Shetland, for example, is subject to regimes through the UK Government and also regimes through the Scottish Government. Rather than just inviting the Scottish Government to be part of a discussion, what genuine action is in place to make sure that a company that is ready to launch has as easy a process as possible to do it, while maintaining all the standards we would expect from it?

Lord Cameron of Lochiel: There is constant engagement with the relevant companies involved. On regulatory aspects, the Civil Aviation Authority is obviously the principal, coming under the Department for Transport. That regulatory infrastructure exists. As far as I am aware, there have not been any issues with it but I would always welcome any input from the Committee.

Michael Shanks: The issue is not so much that individual bits do not work; it is that the landscape is already quite complex. Of course it is going to be complex in a field like this, but is it more complex for companies in Scotland than it is for those in England? That may or may not be the case. As this develops further, we want to make sure that regimes are aligned as much as possible.

Q497 Chair: May I finish with a couple of very quick questions to help us with our report?

One thing that we have heard consistently from the sector, and particularly SMEs and small businesses that are associated with it, is that while they are very grateful for any resource and financing that comes their way, they would much rather be a customer of the Government as this gives added security and allows them to set out plans and grow their



businesses. What do you make of that and what progress is being made to make sure that Governments do everything possible to support that by buying and purchasing the skills that the sector has?

Lord Cameron of Lochiel: Again, I will answer generally and then perhaps Dr Bate could add to it.

In the defence space sector that is well developed. The Government are a customer. In the civil space sector, it is less developed. That is partly because the Government needs change and it is hard, to predict what services Government might want to use or purchase. However, there are still some good examples, data collection being one, datasets being used by Government or making datasets available to Government.

Q498 **Chair:** Just before you go on, one example struck me when we were in the United States. We visited a company in San Francisco, I think. One of its customers was the Welsh Government for a range of services, particularly data-mapping in rural areas. If that could happen there, why can we not use Scottish-based companies?

Sally-Ann Hart: Look at the Welsh Government.

Chair: We will allow Dr Bate to answer that one.

Dr Bate: From the UK Space Agency side specifically, we are funded through research and development capital funding. There are some limits on what we can use the money for, which is why traditionally it has been R&D grants, but we do think that there is a need to move more towards contracts. We have been trying to test to the limit what we are entitled safely to do. That led to a contract not so long ago with a company called GHGSAT, a methane monitoring company, because we could identify a need for that dataset. It was not a requirement that a Government Department had asked for, which is often the challenge, but even if it was not, we could see the value of this dataset in establishing methane plumes in the UK and beyond. We think it is good enough that if the data is available, Government Departments will be able to use it. We would also be able to make contributions to international organisations on methane monitoring. On that basis, we went ahead and that has been very successful, well received by the company but well received by the sector as well. We are pushing the boundaries on what we can do. It is definitely worthwhile.

Q499 **Chair:** Lastly, to you, Dr Bate, could you update the Committee about the new UK Space Agency office in Edinburgh? What progress has been made to realise that?

Dr Bate: Yes. We are aiming to open in June. We are very excited. A number of colleagues from the Space Agency have already volunteered to make that their permanent office location, which is good, but we want to go further than that by moving out of just having offices in London, Swindon and Harwell, which was the situation inherited two or three years ago, to now have locations in Edinburgh as well as Cardiff and



Leicester. We can tap into the talents in those local areas and build those offices up. We want to see the Edinburgh office be a thriving hub.

Chair: On that piece of good news, we will bring this session to a close. Thank you for your attendance today, and thank you, Lord Cameron, for your first appearance on the Select Committee. It went rather well, I would say.

It was good to see both of you. There are a couple of things that we might come back to you about and if there is anything else that you feel you could usefully contribute to this inquiry, please do get in touch. For now, we will finish there.