

# UK Engagement with Space Committee

## Uncorrected oral evidence

Monday 24 March 2025

5.30 pm

Watch the meeting

Members present: Baroness Ashton of Upholland (The Chair); Baroness Bonham-Carter of Yarnbury; Lord Clement-Jones; Baroness Donaghy; Lord Lansley; Baroness Mobarik; Lord St John of Bletso; Viscount Stansgate; Baroness Stowell of Beeston.

Evidence Session No. 7

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Questions 68 – 77

### Witnesses

I: Scott Hammond, Deputy CEO, SaxaVord Spaceport; Alan Thompson, Head of Government Affairs, Skyrora; Dr Adam Baker, Principal Consultant and Co-founder, UK Launch Services Ltd.

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## Examination of witnesses

Scott Hammond, Alan Thompson and Dr Adam Baker.

Q68 **The Chair:** Welcome back to this public evidence session. I am delighted that we have with us Dr Adam Baker and Alan Thompson. Joining us online is Scott Hammond. Thank you all for being with us, and apologies again that this has been a delayed session because of voting in the House of Lords, but we are absolutely delighted that you are able to be with us.

I will, if I may, start with the big general question. In simple terms, what is the case for the UK possessing sovereign launch capability? Who would like to begin?

**Dr Adam Baker:** Do you want to start? You are the rocket man.

**The Chair:** Alan Thompson, I think it is for you.

**Alan Thompson:** Thank you very much. I am responsible for government affairs at Skyrora. Skyrora is a launch vehicle manufacturer in the first instance, looking to provide launch services from the United Kingdom. When we get licensed—I hope—we think we can start that activity within the next two to three years.

Why is the UK such a good place for launch? As you have just heard, we have a burgeoning space sector and lots of ambition among new space companies. We believe that the launch sector is the gap in the value chain to provide an end-to-end service, to give extra value, to inspire new people, new companies, and allow them—as we just heard from colleagues—regular access to space so that they can project and be successful in their business plans.

Skyrora was set up as a small launch vehicle manufacturer and service provider with a view to providing a regular launch service to the satellite cluster manufacturers, particularly in Glasgow and more specifically towards the small sat capability around earth observation companies such as Clyde Space, Alba Orbital, Spire, et cetera. On the whole, the orbits that these companies are looking for are polar orbits or sun-synchronous orbits. Launching from the northern hemisphere north over the Arctic provides an opportunity to deploy into those orbits faster than from launch sites at the equator, which have been traditionally used for geostationary orbits.

We are looking to find a place to launch, preferably in the northern hemisphere and with unfettered access to the Arctic, in terms of being able to fly through airspace and deploy satellites approximately over the Arctic so that they can get into orbit as fast as possible. As the UK has not previously had a launch sector, we believe there is an opportunity right now to create one that is smaller, faster, more agile, and, I hope, more effective than what is being demonstrated in the United States at the moment. For that reason, we have an aspiration to talk about responsive launch: the ability to respond to the customer's needs.

At Skyrora, we are looking not just at transportation services, but at providing deployment services in space. We have a third stage on the launch vehicle which will be supporting the satellites in space once they get there, taking them to their front door—a taxi service, as it were—then supporting them in space after launch. So, yes, we believe it is a good time to provide these services in the UK.

Most critically, we believe that having this logistic service provision to space will give us a voice in space. At the moment most people who are looking to launch are beholden to solutions or services that are in the United States. Without having our own home-based or UK-based service provider, we risk not having that voice and not being able to undertake all these experiments or being able to manifest ourselves better in space. We believe that part of that is, as I said, doing space better, and we think the UK is ideally placed for this right now.

**Dr Adam Baker:** I do not disagree with anything my colleague has said. The UK has a very well-developed space ecosystem, and I have worked in it for 30 years. I started my career at Surrey Satellite Technology, which is the single most successful university spin-out ever in this country. At one point it was a £100 million a year business, but it was then absorbed by a larger aerospace prime manufacturer.

The weakness in the business model for the entire company was launch: delivering satellites to the place where they could do their job effectively. You can build the cleverest satellite in the world, it can look great, but it is of no use at all until you can get it to the right place in space at the right point in time to do its job. From the very early days of Surrey Satellites, launch was done by hitching a ride, or taking the bus if you will, and it was fraught with risk. It was slow. It was expensive. We had to send teams of around 20 people to far-flung places in the world for weeks, occasionally months at a time. It still managed to work but that is taking politics out of the equation.

In the early days of Surrey Satellites we had a great deal of success using what were basically converted Russian ballistic missiles. For reasons I am sure you can imagine, that would not be possible now even if there were stocks of those missiles left; they were disappearing even in those days. For companies such as Surrey Satellites, there is a need for a reliable home-based launch service where you can, figuratively speaking, put your satellite in the back of a truck, drive it up the road with two people, and pop it on the launch vehicle—I trivialise it, but that is really what you have to do. There was one when I worked there and there are now many equivalents, but the need has never been greater; it takes an enormous amount of risk out of our space economy, which the entire country depends on in ways that are difficult to imagine.

Some £30 billion a year of obvious value comes from space missions, and probably 10 times that in intangible value. If you took space away because we were not able to deliver the satellites to do the job when they needed to do it, the country would grind to a creaking halt more quickly than with a Heathrow fire. So the need for launch is very real.

It is sometimes difficult to put hard numbers against exactly what would happen if we did not build our own launch thing, but if you look around the world, the most developed space economies—America, China, Russia—all have indigenous or sovereign launch capability. We are the only well-developed space economy in the world that not only does not have it, but we did have it and we gave it away—and 50 years later, 53 years later to be precise, we are now trying to get it back.

**Scott Hammond:** Thank you very much for inviting me. I took the opportunity of the delay to read two more American reports, which state that America does not have the capacity to increase its launch cadence and that therefore it is struggling to get what it wants up into space. If we want UK payloads to get up into space, the idea that we would be able to do it through America has become doubtful, certainly in the last 50 days. So I entirely agree with both Adam and Alan that the UK needs its own sovereign access to space if we are to grow all the companies that you have just had presenting to you.

Q69 **Baroness Mobarik:** A lot of what I was going to ask has already been answered, but just to say that under the launch directorate within the UK Space Agency, the Government are looking to position themselves at the global forefront of small satellite launch. That is the ambition; but why would firms choose to launch from UK spaceports with UK-based launch firms when they can do so with large multinational competitors? Is there anything else that you wish to add to what you have already said? If so, it would be good to hear it.

**Alan Thompson:** It is important to be part of the value chain and work with other satellite companies, such as the ones that were previously represented. From Skyrora's point of view, it is about the proximity from having those discussions now to getting to a place where we can respond to their requirements. In the first instance it is about the geographic aspect. We need to be nearby and have that alignment so that we can continue and allow access when they need it.

Typically, at the moment, I believe a company in Glasgow is waiting for up to two years to get a ride on a US launcher. The opportunity is there, potentially, for us to do it more quickly.

The second point I would like to share is that, in terms of the health and safety issues of enabling launch and other activity, and the ability to reduce risks to as low as reasonably practicable, our regulatory regime is the basis for a world-leading spaceflight regulatory regime. The issue we have is how that is being deployed and what that means, what the engagement and understanding behind it is in terms of the regulators, and how we measure and agree those risks. But we believe that when we get to regular launch, the regulatory regime will be an enabling regime and superior perhaps to other current regimes.

Going forward, I believe there are plans being talked about of potential free holdings, freeports, within the spaceport opportunity. So a tax regime could be beneficial. Also, as mentioned by previous witnesses,

there is the aspect of export controls and limiting unnecessary barriers. While Josh mentioned the need to go abroad to launch, he did not mention the struggles they have had, particularly in understanding what the solution is with an export control agency, how it is going to be deployed and overcoming those barriers. At the moment, we see an opportunity for doing it within the United Kingdom within that security perimeter fence, essentially. Those are some issues we perceive, but I am sure there are plenty more.

**Dr Adam Baker:** To go back to your question, “Why not go with a multinational?”, I will draw an analogy which I alluded to earlier. The multinationals, SpaceX being the obvious example, provide a bus service. It is a pretty good bus service, but like all buses, it does not go exactly where you want to go. It goes on a fixed schedule and you may be affected by other constraints as well. There are a lot of people who do not want to take the bus or cannot take the bus, they want a taxi, or an Uber these days; they are time-pressed; they want to go to a very specific place the bus does not go; they may have other constraints. Similarly in the world of launchers, you can take the bus, and there are some very good buses out there, but some people need taxis. Both for national defence, and other reasons, taxis are a very effective way to get your satellites to where they need to be.

Again, to draw an analogy from the big four—the United States, Russia, India, China—the other side of it is, if you are reliant on bus services it is not inconceivable that geopolitics may dictate that the bus service gets stopped for whatever reason. We cannot predict the future; my crystal ball is no better than anyone else’s. Launch vehicles or launch providers can simply be told, “We’re not taking rides from that nation/that company”.

I pointed out the importance of space to our economy earlier. We build a lot of small satellites and for the most part they take this so-called bus service, this ride-share service. If that ride-share service were to go away—we saw it happen at Surrey Satellites in the past with Russian providers, not geopolitics-driven, not much anyway, but for various reasons unbeknownst to us, national payloads were suddenly prioritised, so we had to wait. If you have business cases depending on launching at a certain time, such as the RapidEye constellation that we were building for a customer in Canada, or if you have a national need which could be energy-or war-related, and suddenly the bus is requisitioned for somebody else, you have a problem. These are two really good reasons why we need our own launch capacity.

To give a further, very broad reason: there are 200-something nations on earth. Almost every single one is involved in the space industry. They use space technology, they rely on space services, they are chasing space opportunities. There are roughly 20 operating launch sites, but there are 10 nations which actually have the capability to deliver things into space. It is a very exclusive club and therefore it is an extraordinary market that

is only set to grow. We are missing an opportunity if we do not tap into that market of nations building spacecraft.

**Q70 The Chair:** Can you expand on what Governments look at when they are trying to work out investment, which is about revenue and jobs? You have described very well the business case for doing this in the context of opportunities for business to be on time, to deliver what is needed and to not be trapped in any of the geopolitical issues, but is there any sense of what it means to the economy?

**Dr Adam Baker:** Making a business case for launch is tricky. I remember a conversation years ago with someone who now runs a very well-established, very well-known launch company, and he said to me, "It's quite hard to make money out of rockets. They're a means to an end. They are an enabler for the rest of the space industry". I will tell you who it was in a minute, and you will not be surprised. But I can give you four pieces of evidence.

The European Space Agency—we are part of that club, although not, strangely, part of the European club—launches many missions a year and has returned extraordinary pieces of science. It is a big player in understanding climate change, and it does many other good things. For every euro that is put into the European Space Agency—we are the fourth-largest contributor—around €2.50 comes back in extra investment from the private sector. Launch is an enabler for that; without launch, it could not happen.

I can give you very specific examples of where Europe has played a part. Europe has a series of rockets called Ariane. There was a very successful one called Ariane 5, before it came to the end of its life and a new one came along. Ariane 5 launched something called the James Webb Space Telescope, JWST for short, which is the biggest space telescope ever built, many times the size of the Hubble. It is peering into the depths of the universe and providing unparalleled science. It has cost overall around \$11 billion over its lifetime, and Europe, by providing a single rocket that cost about \$100 million, got almost unfettered access to that telescope. So launch immediately unlocks other wider opportunities.

I have other examples I can give you, but my other colleagues might like to say more.

**Scott Hammond:** First off, we are a launch site, very similar to an airport. A number of our customers will not necessarily be from the UK; we have German customers, French customers, we could even have American customers. So, in that aspect, we are opening up launch capacity to the wider globe.

If there is one thing you take away from my evidence today, it is that economically sustainable launch sites are vanishingly rare. Much as countries can be landlocked, we refer to much of Europe as space locked. For instance, Germany would love to have its own launch site, but, unfortunately, due to safety constraints, it cannot. In mainland Europe—

and I include the UK as mainland—you are really looking at two sites, ours and Andøya. I am sure my colleagues in the space industry were monitoring that Andøya was trying to do the first vertical orbital launch from mainland Europe today with a German company called Isar Aerospace. It was delayed because of wind, but they have another 13 days to do that launch.

Coming back to how vanishingly rare these sites are: the problem is that you can go online and see that every single country in the world says, "Oh, we want a spaceport, we're going to do X, Y and Z". They are not sustainable. They will not work.

I will give you an example that I have given to the House of Commons committees as well. If you go to America, there are 40 spaceports. Of those 40, only 14 have a licence, and of those 14, only four actually launch anything. I do not know if I have some ex-politicians among the Lords today, but politicians tend to love having something sexy like a spaceport in their constituency, and certainly, that is the case with the pork barrel politics you see over in the States. We have a massive opportunity because there is just going to be us and Norway as launch sites for Europe.

I know you are interested in monetary figures. All I will say is, we have grown our company to 79 people—I looked yesterday—and we are still increasing in size. I entirely agree with Adam that launch is an enabler. We have a licence for 30 launches a year. It is going to take us some time to get to those 30 launches a year, but it is an opportunity for companies such as Alan's to come and launch, a bit like landing slots at Heathrow. At the moment, Andøya has one launch pad. It is not going to be able to get 30 launches a year out of that. So, if Europe and the UK actually want access to space, we are lucky to have SaxaVord and that clear airspace, clear sea space and direct trajectories to the orbits that Alan mentioned.

If you take one thing from anything I say, it should be how vanishingly rare these sites are, particularly in the northern hemisphere.

**Q71 Baroness Stowell of Beeston:** My question was about the national security implications of not having a sovereign launch capacity. But, with the answers that Dr Baker gave about autonomy, in a way he has already answered that question, unless there was anything else specific you wanted to add. I am conscious of time.

**Dr Adam Baker:** It is probably worth saying that if you have followed the news recently, you will be aware of the President of the United States' actions with regard to Ukraine. There is a very commercially successful satellite constellation—that is a euphemism for a number of satellites working together—called Starlink, which provides broadband in out-of-the-way areas. Its largest customer is the US military, buying basically what was spare capacity.

Starlink was either touted as, “We’re going to turn it off”, or it was turned off, or at least access was restricted from the Ukrainians for a brief period as part of the ongoing, shall we say, discussions regarding a ceasefire. Earth Observation data, which is the unsung second cousin to communications, but is crucial for security, was restricted. The commercial providers of Earth Observation sell images, so any person could go to company X or company Y and say, “I need an image of this particular area”. You pay a cost, but it can be done. However, we are told they were not allowed to sell their images to Ukraine for a brief period.

I cannot imagine a scenario where the UK would find itself in the same awkward position as Ukraine, but it could happen. It is not inconceivable, and therefore our ability to access data and services—we are not talking about satellites or launch, we are talking about what we need to keep the country running—could be put at risk by not having a degree of control over our own space systems and hence some control over launch. That is what Scott and Alan, my learned colleagues, are advocating. In today’s uncertain times, we need the ability to control our own space destiny because of the extraordinary importance of it to our daily lives.

**The Chair:** Thank you. Lord St John, you are joining us remotely, are you ready for your question?

**Q72 Lord St John of Bletso:** Yes, I have a question for Scott Hammond and for you, Alan Thompson. Can you elaborate on future launch operations that are in progress at SaxaVord and Skyrora? I noticed, Scott, that you were talking about 30 launch licences. What can the Government do to promote not just the launch capability but other services, such as in situ resource utilisation and material development in space?

**Scott Hammond:** That is quite a wide question. We always say we would like contracts from Government, not grants. Once you have a contract, particularly in the commercial sector, you can borrow against that from the Government. We all trust the Government to pay their bills, and that allows us to move forward. Up until now a lot of it has been done through grants, which make it quite difficult. With a grant, you have to constantly go back to the grant giver with up-to-date information on where you are and checking milestones. With a contract it is quite clear; once you deliver, you get paid. So I would say that is the biggest thing.

Certainly, the companies that we will have launched are, in effect, start-ups. Yes, they have been going for five, six or seven years, but they have never launched into space. So they need those first few launches to be contracted, in effect, by the Government so that they can get them into space and learn.

Just to give you an idea—Alan, no doubt, will come out with another stat—if you have never launched into orbit before, statistically there is an 80% failure rate for a first launch. Now, that does not mean an explosion; it includes mission failure and so on, but it is important to get over that first step. SpaceX only succeeded on its number four launch. Sometimes in commercial TRLs they refer to the valley of death. They



need to get from the first launch to somewhere where they can scale up commercially and sustainably.

**Lord St John of Bletso:** Alan, could you elaborate on what other launches are in progress? Are you looking not just at launches, but at other services, such as in-situ resource utilisation and material development in space, as we heard from our previous witnesses?

**Alan Thompson:** Skyrora came up with a plan, as Scott mentioned, to de-risk launch. We developed a series of small launch vehicles so that we could try to have those failures in advance. When we got to our orbital launch vehicle, we hoped that we would have covered all failures off and we could only be successful. In an attempt to do this in the United Kingdom, we submitted an application for our suborbital launch vehicle, which was the third vehicle we were planning to launch in this series of de-risking. The journey since 2019 has been rather long but full of education, which has been very useful.

We undertook a launch attempt of that suborbital vehicle in Iceland in October 2022, having worked with the Icelandic Government to create the regulations, the certification process and to allow us to actually do it so that, again, we could learn. The launch attempt was not nominal; it did not go according to plan, which, as Scott said, is why we did it. We learned from the failures and had a wealth of opportunity to learn all the other elements as well, engaging with a huge number of additional regulators, particularly around the environment, that up until that point we had not understood, such as OSPAR in the marine environment. It was a great experience.

In October 2022 we had a conversation with the DfT and the Civil Aviation Authority to see how we might be able to submit the licence application to undertake a suborbital vehicle launch from the UK in 2022, and we are finalising that licence application as we speak. We are optimistic that we will be able to receive it before the summer. We still aspire to launch that vehicle again, from the UK this time, and to learn the lessons and share the lessons of doing it in the UK. We were nominally planning to do it from SaxaVord until we discovered that the Government had provided loan funding to our competitor, Orbex, which we believe has secured a place at SaxaVord. Obviously, we understand that the commerciality of that spaceport is paramount. At the same time, we discovered that perhaps there may not be space for us to launch from SaxaVord.

So we are currently looking for a launch site for this summer. If we are optimistic, we might be able to find a way to do it from SaxaVord, but we have a number of other spaceports that we are entertaining right now. It is fundamental because we want to prove the technology, we want to achieve a TRL 8 on that launch vehicle and then move forward to more regular launches, demonstrating the upgrade of technology and the upgrade of capability. That is a bit about our immediate plans.

The longer-term plans, as I mentioned, feature the idea of supporting satellites in space. It is not so much about the logistics of deploying satellites into the space environment, but more about supporting them once they are there, potentially along the lines of a service that was being detailed by colleagues of in-space logistics. Skyrora has an in-space operating manoeuvring vehicle, or tug, which allows us to support those satellites, move them from one orbit to another, and potentially de-orbit them at the end of life. We believe that by being able to address that issue we will have a more sustainable launch case, rather than just deploying the satellites in the first instance. We are looking towards the provision of what is known as constellation management services. For a small company that has up to 60 or 70 satellites in orbit which are all communicating with another, if one of them malfunctions we would have the ability to deploy a replacement and to provide support.

The other thing that has not been mentioned so far is space debris. We believe that having an operational capability in orbit that we can deploy in a short space of time will allow us to contribute to cleaning up space in the time when the orbital transfer vehicle, or tug, is not being deployed on its main missions.

**Lord St John of Bletso:** I am conscious that we have lots more questions, but my other question is: to what degree can SaxaVord become a truly international space hub?

**Scott Hammond:** I think we are already. The German firm Rocket Factory Augsburg is gearing up for a launch, hopefully towards the late summer. Latitude, a French company, came up and did engine testing with us. You never know, it may come back and look to launch.

We are the launch site for UK Pathfinder, an early UK Space Agency idea for getting launch going with Lockheed Martin, so we have the American part of it. We have been in conversations with companies from places such as Poland, South Korea and Spain, so we certainly have opportunities.

**The Chair:** I am conscious that this debate is moving more quickly than anyone expected, and that there could be a number of votes. I want to group the next set of questions together, which are about barriers to growth, so that you all get a chance to answer them. Lady Donaghy, do you want to introduce the subject? I will then add on one question. Indeed, you could add on Baroness Bonham-Carter's question.

Q73 **Baroness Donaghy:** I will be speedy in case we get interruptions. Apart from access to launch, what are the other key barriers to growth that your businesses face? If access to capital is a problem, that would be useful to know. Also, do you have any skills shortage issues?

**Dr Adam Baker:** I am happy to give a couple of quick answers, and I am sure my colleagues will give more extended ones.

When you are a small company and you are not in the business of launchers or spaceports—there are many, many companies which are not

doing these high-profile, exciting, dramatic things—the barriers to growth are that often people forget about the rest of the supply chain: the folks who do the logistics, who do the licensing applications, who work out the safety cases, and who do all the things that actually glue a launch system or a vehicle to a launch site and make sure that they work in harmony together. They are the unsung heroes who tend to be forgotten when you are writing a grant application and trying to show that it is world-beating and innovative and incredibly disruptive.

Actually, there are a lot of what I would call boring things that need to be done—boring but necessary and critical things, such as safety assessments for launch. We are a very busy country. We fly a lot of aircraft around our shores and there is a lot of sea traffic. While I am sure Scott thinks he has a handle on all that, to thread a launch vehicle flight through that very small needle and not disrupt hundreds of transatlantic flights is harder than anyone cares to admit. It is doable, do not get me wrong, but those things need to be worked out so that at the end of the day, the launch vehicle can light on its launch pad and the smoke and flame go off and everyone is happy. That is quite hard to do, so it is critical not to forget the rest of the supply chain.

Just to quickly answer your other question about getting the right staff, the training and the exercise: we are losing our knack of being a nation of problem solvers. I have worked in and out of the academic community for most of my working life—I sit on the fence because it is a fun place to be—and I do not see enough problem solvers coming out of our universities. We produce engineers and we produce scientists; many of them come from abroad and some go back—it is wonderful that they want to do that—but when it comes to problem-solving techniques such as how we come up with the next generation launch vehicle technology or how we operate launch vehicles in a very congested aviation and maritime environment, I do not see enough people coming out of universities who know how to solve problems, given not enough information and not enough time. So we need to take a look at our education sector. It is a much wider topic, but problem-solving ability is crucial for this really tricky game.

**Alan Thompson:** I would start with education before capital and skills, because the single biggest delay to our activity has been the ability to educate people on what exactly it is we are trying to do. That goes for engagement with the regulator and engagement with the agency. What is launch? What does it mean? What are the steps? As my colleague just mentioned, what goes into it? What is the concept of operations, and who needs to be aware of that, who are the stakeholders, who do we need to engage with, how do we engage with them, what do we need to represent?

I would suggest that when a commitment was made to pursuing a launch solution, this question in terms of education had not really been answered at a government level. It has been a little haphazard, it has been very much led by commercial legal entities trying to undertake it.

On our behalf, we have been seeking engagement with the relevant stakeholders to educate them. That is the way we are, I hope, going to receive our launch licence very soon, but that education journey has been taking a long time.

In terms of capital and skills, as mentioned, launch is a black box until we are doing it commercially. It is quite heavily capital consuming. As a rule of thumb, a launch vehicle manufacturer such as Skyrora would probably need in the region of £150 million to £200 million to get to a viable commercial launch service, even without the numerous failures on the way that you need to learn from. To get venture capitalist investment you need to have a plausible business case, including the deliverables and when you are going to see that happen. As I believe was said earlier on, it is a very tricky deal, it is very awkward because until you get there you need to find different ways of financing yourself. That includes grant funding, but as mentioned by previous participants, grant funding does not have the same demand and the drive that we need. So it is not just about the available capital, it is capital that can actually allow us to speed up. It is like getting into orbit: we need to get to a critical velocity first, to be able to achieve critical velocity in terms of manufacturing capability on the ground, so that we can get and make that £150 million to give us three launch vehicles ready to launch on the pad when we finally start our commercial service.

In terms of how we get there, yes, it has been a long and painful journey, talking to VCs who say, "I would love to be number two, who's your number one?" The way we have managed to mitigate that so far has been by looking for incidental commercial deliverables or contracts that we can find or entertain with parts or bits and pieces of what we have already manufactured. That includes propulsion systems or our advanced manufacturing capability, 3D printing. We are currently delivering on commercial deliverables or commercial contracts where our capability around developing and testing engines is critical. Airframes and 3D-printed parts allow us to have a commercial deliverable and begin to leverage those commercial deliverables against longer-term capital requirements.

We are now at a stage where we are delighted to have completed almost the first year of good commercial service, and we are looking to roll over in the next year and increase those commercial deliverables while at the same time still not forgoing our strategic goal of commercial launch. That means we now need to start looking for contracts where launch vehicles are relevant.

One of those areas is becoming more integrated into the defence world. Since we were founded in 2017 and up to now, we have spent a lot of time working on the civil side of things. As I mentioned earlier on the education point, and has been reflected in colleagues' comments, there has been a lack of engagement on the space agency side with defence or even with the security side of things, which has left a lot of questions unanswered. I believe there is a useful piece of work being undertaken by

DSIT, which is looking at strategic capabilities and being able to join those dots across government, particularly so that companies such as ourselves, who have a propulsion system, can find a category within defence that fits up and means we might be able to deliver in a commercial sense. That is a piece of work that is beginning to help us but, to be honest with you, that journey has been rather arduous. We are trying to join those dots ourselves, but on the capital, we are in a good position now and we are looking to build upon that going forward.

In terms of skills, we have spent a huge amount of time working in the area of STEM, working with primary schools in and around the central belt of Scotland, around Cumbernauld, Midlothian and Glasgow. We have a useful relationship with Strathclyde University Aerospace Centre of Excellence.

One of the areas that has been mentioned is propulsion engineering. In the United Kingdom we were very proud of that 50 or 60 years ago; in fact, when the UK ceased its launch programme in 1972, a lot of that propulsion capability went abroad and much of it ended up in the European Space Agency. So we are, in effect, in a position where we need to give rebirth to that propulsion engineering capability. We are acutely aware that we cannot do it by ourselves; we need to teach and educate the propulsion engineers of tomorrow. We are very much engaged in and looking to achieve that precisely because it will be our strategic capability going forward.

**The Chair:** Thank you. That is a huge amount of information there.

**Scott Hammond:** I was very interested in what Adam was saying about problem solvers. I would back that up, although I cannot talk with his knowledge of what is coming out of the university sector. Let us look at skills. The UK has never had a spaceport, so we could not go and just copy and paste and get people who had already run spaceports. We had to look around for the problem solvers, as Adam has alluded to. We ended up getting a lot of ex-military people; a lot of the founders are ex-military pilots, and one of us is a test pilot. We have also taken on people from the Royal Artillery because they have skill sets from the military that can be adapted to what we do on the spaceport. So a lot of our early hires were from the military, and I would like to say, Adam, the military are problem solvers, so hats off to everybody who has left the military and moved into commercial areas.

I echo what Alan has said on the STEM side. When we are recruiting, we look for the person and then we work on how we can train them to get to where we need them to be. We took on a young man in Grantown-on-Spey who came from the Cairngorm Brewery; he started as an admin assistant, and following in-house training he now works within the range team so he will be part of that.

We have a young apprentice up in Unst, which is the island in Shetland from which we are going to be launching. He joined us about six months

ago, aged 17 and straight out of school, and he is now learning how to run a spaceport.

So a lot of it we have to do internally, but initially we used people with transferable skills, particularly from the military.

Then we come on to capital raising. How long do you have? We kicked off in 2017, exactly the same as Alan, and we are a purely private undertaking. We walked the streets of London trying to find money to get us going and it was really, really difficult. It was not helped by the fact that there was another place called Sutherland Spaceport, which was being supported by the UK Government. Quite often we would go in, everybody would like our pitch, but they would say, "You're not the government-supported launch site". It took a lot of time for us to overcome that. Now we are the spaceport, and Sutherland Spaceport is becoming a bit of history, but that took a long time. We were very lucky in finding some high net worths who were able to support us and go through the series A, series B, et cetera, as we worked our way through. Really, it came down to a huge amount of hard work and believing in what we were doing.

Our CEO Frank Strang will always talk about resilience and stickability. We had to keep going. For two years, we were not paid. So it has been a long, hard route, but we are now in a very good position. We are still looking for more capital because it is a very capital-intensive business. Alan talks about £150 million to £200 million; we are probably looking at least £100 million just for the spaceport. So it has been very hard.

**The Chair:** Tough journeys are part of the story that we hear, which is of course incredibly interesting but also challenging for you all. So let us move on to what we want from the UK Government. Lord Stansgate, do you want to begin with three quickfire questions?

Q74 **Viscount Stansgate:** Thank you, Chair. We are a committee, we are undertaking this investigation and, as you would expect, we are going to produce a report with recommendations. What would you like to see the Government do to help the space launch sector? We are very keen to know what practical recommendations we can make based on the evidence that you give us.

**The Chair:** If you could please give us your top two or three rather than the 55 that I am sure you will inevitably have, that would be really helpful.

**Dr Adam Baker:** Shall I kick it off? The launch bit that most people are aware of is part of the puzzle of what is called a wider integrated space economy. If we want to go out there and, as Lord St John asked in his question, use in situ resources in space, we need more than just a rocket. Most rockets drop things off at the top of the atmosphere. Skyrora is a little different. It has an additional stage, a mini rocket on top that can do this tug function, but that is unusual. If you want to go anywhere beyond low earth orbit, anywhere beyond about 1,000 kilometres or 500 to 600

miles in altitude, you need something else. You need the tug and the current launch vehicles we are developing are mostly lacking that tug. Again, Skyrora is the exception and I am really pleased to see that, but the problem of in-space transportation is significant, and one that is being widely ignored because everyone says, "SpaceX has solved the problem of getting into orbit, you can just get a ride with them".

There are obviously difficulties with that, but if you want to go on to build space solar power stations and solve climate change, if you want to go on and mine the asteroids and stop digging heavy metals out of our precious land areas and destroying our national parks, if you want to go and inhabit the surface of the moon and pull out the water and live there and use it as a proving ground for going on to Mars, you are going to need something a bit more than the rockets we are developing these days. You need approaches to space transportation.

I spend a lot of my week working for a company called Magdrive. We are working on advanced propulsion systems to do the bit that does not involve getting from the surface of the earth up to space, and I think the space agency could be encouraged to support those. It is probably, for various reasons, quite focused on launch. We have spent £111 million on it so far, give or take a few pounds, and we have had one—unsuccessful—launch in five years, so it is probably thinking, "Do we need to put our hands in our pockets and invest some more?" Perhaps it does, but there are other problems as well that we could be looking at. Encouraging our space agency in that area would be good and perhaps looking at more innovative approaches to launch.

The rockets that Scott's spaceport supports and the rockets that Alan's company builds are lovely, but they are quite conventional in their designs. They are based on what I call legacy architecture from missiles built 60 years ago. There are many different ways to get into space; some involve building things with wings. You cannot fly an aircraft into space, but you can get a useful portion of the way. There are people developing spaceplanes, which were talked about a lot in the early days of our launch programme and now seem to have fallen by the wayside. I am not saying they are a solution for space transportation today, but it is something we have to think about for the future.

Eventually, we will, for better or worse, probably lose this race into space, because we know that it is very hard to make an economic success out of launch vehicles, especially when we came 50 years too late to the game. We will provide some useful capability, and perhaps Scott will, in his dreams, reach 30 launches a year. I very much hope he does, actually, I would like to be there to see it, but we have lost that race. SpaceX is winning that race with conventional rockets.

We need to be thinking a few jumps ahead as to how launch or delivery to space and going further out will be done in the next 30, 40 or 50 years? We have a space agency that is willing to do that. It has a chief engineer's team that has actually said openly, "We are willing to get involved in studies and explorations and bits of research into next

generation problems”, rather than just saying, “Well, we can review them, but it is up to industry to do the hard work”. It wants to get involved, and that is really laudable.

To capture that all in one go, I would say the space agency is wonderful—my superhero, by the way, it is so different from what was available when I started my career 30 years ago—but I would like to see it get out more and work with the troops. We are working really hard, Alan and Scott and many others, to try to succeed in a really, really difficult business. I would like to see the space agency try to work a little more in partnership, get out there, be involved, take part, give critical comment, saying, “Could you do things differently, or better?”, help us with the regulatory side of things, et cetera. I would encourage it to do that. But, let me be clear, the space agency does a great deal of good already. It could do more but let us not knock it for all the things it is already doing.

**The Chair:** I will just interject about the experience of working with the agency and what more it could do. You have answered that. So just to say to our other two colleagues, please, adding on to what Viscount Stansgate said, if you could please cover that as well, that would be great.

**Alan Thompson:** Based on what has been said already today, the one thing I would like to share is the excitement and enthusiasm and ambition for space. I believe there is an awful lot of opportunity out there and we are getting lost in the detail of trying to understand it better.

**Baroness Stowell of Beeston:** Hear, hear.

**Alan Thompson:** We are not getting excited about it. Where is our ambition? It was mentioned in the previous panel that we can do an awful lot better, and we have that opportunity in front of us in space, to cover the security aspects and join the dots faster. One suggestion that was relevant is the creation or the functioning of a national space council, which we believe would help join those dots and make those efficiencies.

Space is a great driver of efficiency, it is a catalyst, and the more we do it, the more we can do. That is why it is exciting. It is that excitement that we need to remember every time we are having these discussions and allow that to fuel our ambitions. Without that, we will not see more companies like we have just seen in the previous panel that want to build their dreams on orbit. We need to be, as Adam said, problem solvers. We have the ability to license activities such Space Forge’s. Let us do it more, let us be less afraid of doing it and let us encourage that.

**Dr Adam Baker:** We should take more risks.

**Alan Thompson:** Absolutely.

**The Chair:** Mr Hammond, do you want to join in?

**Scott Hammond:** I have already spoken about launch contracts, but the other thing that is pretty important is the Government as an anchor



customer. Why would the MoD try to launch its satellites from anywhere else apart from the UK and a UK launcher? The Government should look at that and try to support our national industries rather than sending the money abroad.

**Lord St John of Bletso:** Hear, hear.

**Scott Hammond:** I back up what Alan is saying about the national space council, and we sometimes get very frustrated trying to understand who is actually driving space policy. What does the UK want to do? I would not say the UK Space Agency is my hero, unlike Adam, because to be quite honest I am not quite sure what the UK Space Agency is trying to do. The DfT is involved, it is in control of the CAA, so it has an input; obviously the Ministry of Defence has an input; and other ones such as Defra all have input into space because it goes across the whole of government's capabilities.

We have always said we would like to see a space tsar or somebody in Cabinet who represented space so that there could be a joined-up policy as to what we are trying to do, and for a while, in the Johnson Government, they were talking about this. But, at the moment, if I look, who is driving any of this? I do not see the drive coming out of the UK Space Agency. There is a bit from DSIT, which is the department above the UK Space Agency. The Ministry of Defence talks about assured launch without actually defining it. Somebody in government needs to grip it, get it all together and then lead so that we have a proper space strategy.

Q75 **Baroness Mobarik:** The conversation has moved on from what I wanted to ask, but it was just a question for Scott Hammond. You mentioned that there was a requirement for more launch facilities. Would there be some merit in having a cluster up in the north, and would it not be useful to have the Sutherland Spaceport come online as well?

**Scott Hammond:** No, I do not think that is the case. Without getting into the technical aspects of the Sutherland Spaceport, it is in the wrong location. If it wants to launch, it has to go over to the Faroe Islands, which from a safety point of view is a no-no. It has to do what is called a dogleg, which is technically feasible; it ends up first launching towards Shetland and then turning in the gap and going on to the trajectory it wants to go to. That costs payload, so it makes it a much harder spaceport to operate from a commercial point of view. We have three pads in our planning approval now, and we are looking to increase to five pads.

To go back to a military analogy, we should reinforce success. We are successful. If we need capacity, reinforce us. The other locations just do not cut it, I am afraid, from a safety point of view.

**Lord Lansley:** What you have had to say about a sovereign launch capability has been very interesting, but I wondered if I could just explore and ask you to tell us a bit more about the role of the European Space Agency in relation to UK launch services and capability. To what

extent are we working and should we work in and through ESA's programmes, and to what extent can ESA's programmes help support our own capabilities?

**Dr Adam Baker:** I will do my best to answer that succinctly, as it is worth an hour or two's discussion, possibly with a pint. ESA is an extraordinarily valuable institution that we were a founding member of some 40 or 50 years ago. It allows us to leverage our modest capabilities in a way that would not be possible otherwise.

To give you an example, ESA sent the first mission to land on a comet. Broadly speaking, if you added it all up, it cost less than what the average person spends on shampoo in a year. We landed on a comet and inspired a generation of children; I inspired some myself by talking about it, and we learned about how the solar system was formed. We could not have done that ourselves, but we played a key role in that.

We leverage our capabilities. We are the fourth-largest contributor to ESA. Roughly 5.7% of ESA's just under £8 billion a year budget comes from the UK, and we are very proud to contribute that and to keep looking to how we can do more every year.

However, we still need a strong national programme. The reason is that ESA is quite a competitive environment. For the UK to pitch its technology and approaches in there and to win a piece of the pie that we are paying for, we need to have excellent technology. What goes in comes out, through a process the French call a *juste retour*, or what you put in ultimately needs to come back is, broadly speaking, the equivalent. It needs to have the risks retired and to be tested, possibly in space but not essentially, and we need that national programme to be able to get our just deserts from the ESA contribution that we make.

I am certainly not advocating that we should diminish our role; we are in a very strong position with ESA and probably punch above our weight in terms of the voice that we have within ESA, not particularly in launch, but we have decided to do that nationally, for better rather than for worse. But it is important to continue our national efforts through things such as the National Space Innovation Programme run by the space agency and the international bilateral framework that allows us to do things with other specific countries such as the United States, Canada and Japan. All those things are important.

To summarise, ESA is a really good thing. We absolutely do not want to leave that club. We get things out of it that we will not get anywhere else in the world, but it is very important to have our national programme to make sure that we can get best value out of ESA and help us become ultimately the most intelligent customer for those negotiations within ESA and with the rest of the world. If you do not have a national programme, you are not a very intelligent buyer, and we buy space services, goods and technologies from the rest of the world. There is a good balance to be struck. I think we are finding that balance, but it should always be

subject to review, to say, "Could we do it better?" I hope that answers your question.

**Lord Lansley:** Can I just ask one additional question? In a sense, with *juste retour* and the way it works, you have to decide in what areas of ESA's activity you are going to participate in order to derive the benefit that comes back to you and work out where the greatest return lies on those things. There is an ESA ministerial towards the end of the year, and presumably there are decisions to be made about what those programmes are, but are there programmes that ESA is moving towards that are directly relevant to our launch activity or capabilities and that we should choose to participate in?

**Dr Adam Baker:** Yes, there are, but I would quite like to pass the buck to my colleagues, who are very familiar with those specific programmes and will have a more educated response than I do. Alan?

**Alan Thompson:** Yes, we have been exposed to the Commercial Space Transportation Services and Support Programme within ESA. In fact, our experience is perhaps not indicative of what Adam has been talking about. There is an opportunity to do an awful lot more, engage better and inspire. At the moment, the worry about engaging with ESA—particularly for companies such as ourselves and the environment—is more of a risk of competing with a specific group of European competitors without necessarily understanding what the return is. From that point of view, we are actually more of a discerning user, and as I said, we would like to achieve more.

What does that mean? In our Commercial Space Transportation Services and Support Programme grant that we were awarded by ESA and the UK Space Agency, we think that there could have been more deployment of collective capability around propulsion systems. ESA is almost the guardian of the European Cooperation for Space Standardization, which is basically the standards that we have applied to qualify our engines and their test activity. As I said, we hope we can go further and start being able to lead those programmes.

At the moment, we feel that with our experience of going through Brexit, ESA became synonymous with European institutions and there was a question about whether we should be part of that. As Adam suggested, there is a greater opportunity and we should continue to persevere because having a supranational structure that allows us to project next-step ambitions in space is fundamental. That is the main value that we need to look forward to.

**Scott Hammond:** You might be alluding to the European Launcher Challenge, which is just coming up. The ITT for that came out on Friday, and that is about trying to get European assured access to space on larger rockets than we are currently looking at with Skyrora, Rocket Factory Augsburg and so on, and that is looking at about €150 million towards that.

My gut feeling on that is yes, the UK needs to be part of it, but probably in partnership with another country because you are starting to get into very large numbers, much more complicated systems, et cetera. So having another country involved is really helpful. The country we would probably be looking at is Germany because the French tend to want to go on their own because they have a lot of launch heritage.

**The Chair:** You are doing really well energy-wise. The last question from Lord Clement-Jones and then Baroness Stowell wanted to add something.

Q76 **Lord Clement-Jones:** You have all touched on the regulatory aspect; Scott talked a bit about inputs from various areas and wanted a tsar. The question is: what are your reflections on the UK's regulatory environment for orbital launch? Would you make any changes to existing regulatory frameworks? Alan, you were quite complimentary about the almost liberal nature of the regulatory framework here, but some of you have also mentioned the European Space Agency launch standards and so on, and I wondered if you could perhaps start with your reflections on whether we need to do more in terms of UK regulation itself.

**Alan Thompson:** The immediate answer to the question is that we want to do more relevant regulation, and in fact, that is the question we and colleagues are being asked now by yet another consultation being conducted by the DfT on the Space Industry Regulations 2021 in preparation for the mandatory review next year.

**Lord Clement-Jones:** Is that looking at the Space Industry Act and things of that sort?

**Alan Thompson:** Yes, the spaceflight regulations that enable us to launch, which were published in 2021. I believe there is a five-year period after which they have to be reviewed. We just completed the regulatory review of the Space Industry Act with the Department of Science, Innovation and Technology in the middle of last year, which we believe it was more responsible for. At the same time, it managed to include an aspect of launch into that.

The review came out with, I believe, seven recommendations, and in terms of next steps, it is moving towards what are known as regulatory sandboxes. I mentioned earlier that the biggest challenge—particularly from the launch point of view—has been education, educating the regulator in the activity that we need to undertake. Not just the launch regulator but the risk managers: what are the risks of what we are doing, how do we measure them, and what does it mean in terms of reducing them to as low as reasonably practicable? What mitigations are available?

In terms of where we have got to with the sandboxes, we believe this is actually a great suggestion and a great opportunity to have a better conversation with the regulators to allow that education to take place more quickly. I know that the rendezvous and proximity operations sandboxes have now undertaken two sessions, but the sessions definitely have not had launch involved, which is somewhat of a failing. But let us

just say that they are starting these sandboxes to ask a better question and allow better risk management, which we believe will again build upon the regulatory regime and the basis that we have so far.

It has been a rather long journey to get here in terms of how we made it happen. We sought engagement, and indeed, when my colleague from Space Forge was providing evidence to one of the previous Science, Innovation and Technology Committees on 1 March 2023, there was a challenge—particularly to the regulator and the regulatory regime—which was then followed up and has now found its place within the regulatory review. We think that was a particularly effective engagement and would perhaps encourage more such interventions from the Government to make sure that progress is being made in that kind of manner.

**Lord Clement-Jones:** So broadly in the right direction as far as you are concerned.

**Alan Thompson:** But not fast enough.

**Dr Adam Baker:** We like to portray ourselves as a country with very well-developed regulations that is attractive to people in the rest of the world who do not have that, and draw businesses to this country. To a certain extent, that might be true because if we did not have a regulatory framework, you could not come here and launch a rocket into space, but that is where it stops.

It would be quite fair to say that a lot of our space businesses thrive and succeed in spite of rather than thanks to the regulator. To give you an example, the FAA—the Federal Aviation Administration—in the United States is able—when it is a well-put-together application—to turn around a launch licence application in 90 days, three months. To be fair, it has been at it for a lot longer than we have: 50, 60 years over there, so it has experience.

The thing that I struggle with is that our regulatory team is not experienced, despite being well minded and having a, shall we say, reasonably thoughtful, well put-together set of regulations and an approach to it. I should know because I trained quite a few engineers and scientists in that team, and I know exactly what they do not know. They have never been hands-on with a launch vehicle, been involved with a suborbital launch or put together a flight propulsion system. Again, I do not mean this to sound too negative, but they do not know what they do not know.

It is very difficult for our regulators to assess different, unusual concepts beyond the relatively conventional architectures we are dealing with now in order to say, “Well, this would be a good one to support”; for example, air launch systems like we saw for a while with Virgin Orbit—sadly, that business was not successful. That was nothing to do with the UK; it was just poorly structured. I worked on the early business case for Virgin Orbit, so I do know why it got it wrong.

Another thing that we could be doing in the future is spaceplanes. Our regulators will and are already struggling to understand those more innovative concepts when they are put in front of them, and it is reflected in—as Alan has said—the long periods of time they are taking to process applications. As I am sure Scott will say in a minute, it took him a long time to get the licence for a relatively conventional—not meant in a negative way—vertical launch spaceport. You have a great spaceport, Scott; I really like what you are doing up there, but it is the way it has always been done for 50 years, and it is not the only way to do space launch. We can drive things off runways if we so choose; we know how to do that, but the regulatory environment is not helpful.

The last thing to say is that we are not really thinking about sustainability in terms of how we support and regulate launch, and it would be very interesting—interesting with a capital I—if our regulators could be encouraged to look at, shall we say, more sustainable, reusable, low-carbon or carbon-neutral concepts, and perhaps consider fast-tracking them in order to see whether we could really do the next generation of space launch systems in this country. Right now, space launch is not very sustainable. The rocket largely falls in the sea and pollutes; it leaves enormous amounts of CO<sub>2</sub> and injects it right into the stratosphere, where it really matters.

Launch is not done very well at the moment, regardless of what Elon Musk and his colleagues—Jeff Bezos and others—might have you say. We have a chance to do it a little differently. We are building a good basis to do that through the hard work of Alan's company and Scott's spaceport, but we have the chance to do better and be different and show the world thought leadership, if you will, about how launch can really be done going into the 21st century.

**Scott Hammond:** I would back up both Alan and Adam, but we have to be fair to the regulator; it was doing it for the first time. Just as we are doing the spaceport for the first time, so was it, and I appreciate, Adam, that you were the trainer; I thank you very much for that. But it does not know what it does not know, and that is reasonable; it has done its best.

It goes over to America and tries to get advice over there, but it always has to adapt it to the UK way of doing things, which comes back to our more outcome-based attitude to regulations. America is starting to change a little, but up until now, it has been prescriptive. "These are the numbers you basically have to hit, and then you can get a licence". That is not how it works in the UK with our "as low as reasonably practicable". So there are all those aspects.

**Lord Clement-Jones:** Do you object to that form of regulatory culture and outcome-based regulation?

**Scott Hammond:** No, not at all; it allows for innovation. We have been able to go to the CAA and say, "This is how we intend to run our spaceport from a commercially viable point of view, and this is why it's safe". We could go and give that to it, so it is actually an advantage.

When we started, we looked for regulations but they did not exist, so we looked at American regulations, which are prescriptive and have numbers. Initially, clients would look around the world and then come to us and say, "Okay, what is the probability of failure that we need to put in?" It is not that; you say what you are doing, why you are doing it and why it is safe. So it is turning it on its head, and it takes a bit more thought up front, but you have the opportunity to effectively do what you believe to be correct.

The other thing is where space regulations start and stop for launch in particular. We had an anomaly with Rocket Factory Augsburg last year, when there was an engine fire on the launch stand. That did not come under spaceflight activity because we were not trying to launch; that came under the Health and Safety Executive, so we had to put in a RIDDOR report. In fairness to the Health and Safety Executive, suddenly getting a report on an engine fire on a rocket is a bit unfair.

Within the HSE and CAA, they are talking about how they can cross-fertilise those skill sets so we are still being regulated in a safe manner but have the right person looking at it. I totally agree with Adam; they were learning and are going to continue to learn. We are going to learn for the next five to 10 years, and so will they, but the basis of outcome-based regulations is the way to go.

**Lord Clement-Jones:** Thank you for those different perspectives.

Q77 **Baroness Stowell of Beeston:** I just wanted to ask a question about regulation, but from a slightly different perspective. It goes to what we have heard from you and the witnesses on the previous panel about the ambition to scale and for us as a country to get ahead, all that sort of thing. I just wondered whether you face any competition issues in terms of access to market, the dominance of SpaceX, or anything else that leads you to question whether there is a role for the competition regulator in this space.

**Alan Thompson:** If you look at the facts today, I believe the other company that is operating out of SaxaVord—Rocket Factory Augsburg—already has its launch licence. Skyrora started engaging with the regulator in 2019, prior to the industry regulations being written, and we tried to go through a process of de-risking launch, as I mentioned.

We submitted an orbital launch licence application as soon as we possibly could; I think that was in 2022. As I said, we were told that we could not launch until we got a licence; that is why we went to Iceland to undertake the suborbital launch from there. We are now finalising the licence application for suborbital launch in the UK. We are definitely interested in understanding how a company—Rocket Factory Augsburg—that was created after us has managed to achieve a licence in the UK.

Obviously, that is a competitive statement. We think it is great that it has one, but we are interested to understand if we have had so much time to invest into the regulator to educate it and for it to understand what it is

that we are doing in risk mitigation, we can only question how it is that a company that does not currently have a full orbital launch vehicle has a licence when we were still looking to undertake the suborbital launch to learn lessons.

**Baroness Stowell of Beeston:** But that is a question of the approach of the regulator that issues licences as opposed to market dominance of another player that makes it harder for you guys to access or compete, that sort of thing.

**Alan Thompson:** We believe that we made that investment into the regulator to educate it so that it would become more of a UK accessible thing, a journey that we made with our other competitor, Orbex, when we started. We spent equal time with the regulator trying to allow it to understand the solution in a more generic way. We still hope that that investment will have a return on it, but that is where we are today.

**Baroness Stowell of Beeston:** Mr Hammond, was there anything that you wanted to add from your perspective?

**The Chair:** The vote is coming, so if you could be brief, I would be really grateful.

**Scott Hammond:** We are very keen to see satellite regulations sped up because ultimately, they are our bread and butter for the spaceport and the launcher, but we need them to be able to get licences very quickly. We would also like to see Skyrora and others get their licences quicker.

**Baroness Stowell of Beeston:** We are probably talking at cross-purposes.

**Scott Hammond:** From us competing against other spaceports around the world, if we can get our payloads licensed more quickly, that would certainly be an advantage.

**The Chair:** Thank you so much for bearing with us and for giving up half your evening at this rate; it is extremely kind of you. I formally thank Dr Adam Baker, Scott Hammond and Alan Thompson for joining us, and close this public evidence session.