



HOUSE OF LORDS

Science and Technology Committee

Corrected oral evidence: Financing and scaling UK science and technology: innovation, investment, industry

Tuesday 16 June 2025

10.15 am

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Members present: Lord Mair (The Chair); Lord Berkeley; Lord Borwick; Lord Lucas; Baroness Neuberger; Baroness Northover; Lord Ranger of Northwood; Lord Stern of Brentwood; Viscount Stansgate; Baroness Walmsley; Baroness Willis of Summertown; Baroness Young of Old Scone.

Evidence Session No. 14

Heard in Public

Questions 152 – 168

Witnesses

I: Lord Willetts, Chair, Regulatory Innovation Office; Dr Scott Steedman CBE, Director-General, Standards, BSI.

USE OF THE TRANSCRIPT

1. This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Examination of witnesses

Lord Willetts and Dr Scott Steedman.

Q152 **The Chair:** Good morning, and welcome to this Science and Technology Select Committee. We are very pleased to welcome our two witnesses: Lord Willetts, chair of the Regulatory Innovation Office, and Dr Scott Steedman, director-general, of standards at the British Standards Institution, who is attending remotely via Zoom. Thank you both for coming to give evidence to us this morning.

Before we move into asking about the role of regulation and standards in more detail, as you both know, this inquiry is trying to address the problem of financing and scaling of UK science and technology companies, on which you both have given evidence in the past. After you have introduced yourselves, can you tell us how you view the current landscape in the UK for scaling up innovative companies? The launch of the industrial strategy is impending, and the spending review has been announced. In which areas do you feel that more policy action is required to address this problem? What are the Government's current efforts to address it, and do you think they are adequate? Let us start with Lord Willetts, please.

Lord Willetts: Thank you very much for the opportunity to give evidence to your committee. I am, of course, a Member of this House, and chair of the Regulatory Innovation Office.

Patrick Vallance's agenda—which I also tried to deliver years ago, but I think he is having more success—should, as a minimum, recognise that there is a real problem. On the public sector side, it should try to align research councils, Innovate UK, the British Business Bank and the National Wealth Fund in a coherent flow, so that it is clear to a start-up technology company doing activities of national economic or security significance where it can go to at least apply for financial support—not to be guaranteed it, but at least to know what the relevant agency is. That is an admirable vision, and we are getting closer to it. I particularly welcome the increased resource for the British Business Bank in the recent CSR, which could help a lot.

However, there is a fundamental problem, which I have never been able to resolve in my own mind: VC has a different function in the UK from in the US. In the UK, when companies have VC investors and are then launched on to the market, that is an opportunity for large US investors to buy them, whereas US VCs try to grow their companies in the US. To some extent, some of these mechanisms

are creating a marketplace for the big guys to come in and buy them, which was why, as I said in the debate we had in the House the other day, my minimum objective when I was closely involved—it still is—was that it should at least be a rational decision for a US investor to leave as much activity as possible in the UK, even if they own it, on the grounds that the roots and capabilities here are so great that they should not require that it all shifts to the west coast.

Although I regret the sale of Solexa, which I think would have been the world's great genetic sequencing technology, at least we still have the Sanger Institute and a big Illumina R&D facility. Although I kind of regret the sale of DeepMind, which would have been the equivalent in AI and machine learning, as I said in the House the other day, when you ask Demis Hassabis about this, he says, "I needed \$1 billion-worth of compute power a year to operate. There was no public or private agency that would do that in the UK". At least he is active in King's Cross.

Dr Scott Steedman: Thank you very much for the opportunity to give evidence today. I am director-general, standards at the BSI, and I am responsible for the national standards body. We are appointed by the Government through the Department for Business and Trade. It is a great pleasure to have this opportunity. I will focus more on the standards and regulation side, and I am sure that Lord Willetts will pitch in.

In my view, the current landscape for scaling up innovative companies is extremely challenging, but it is not a new problem. It has become much more of a threat to our prosperity in the last decade than it was before because of the accelerating pace of technological change, global tensions and the global digital transformation.

Historically, our attitude to standards and regulations as a driver of growth has been rather dismissive. Other countries—perhaps we can talk about this—have taken a very different path, seeing standards as a key driver for market access and competitive advantage. After some years with the BSI, I would say that this is largely due to a real lack of understanding of the role of standards and regulation and how they enable innovation. I welcome your efforts to address that issue in the inquiry.

Perhaps the first and most important step I would recommend is a change of mindset. In the UK we need to reflect that standards, including regulations, are part of the landscape of business information that companies need to understand and exploit in order to be successful. Our role at the BSI is to work with UK industry,

government and consumers to make better use of what I think of as a world of knowledge out there, which, if you use it as part of a systems-thinking approach, will accelerate outcomes.

It is really important that we make strategic use of standards and regulations and we try to build an infrastructure together, with Lord Willetts and the RIO and the rest of the national quality infrastructure. That will provide the framework that nurtures the success of emerging technology ecosystems. We can look at other countries as examples to see where that has indeed happened.

I like to think of standards as a sort of information scaffold for start-ups to scale up. We have lots of start-ups, but we do not see them scaling up, and this area of standards and regulations is a big reason why they do not make it. We have all the components in the national quality infrastructure and leading-edge influence globally in this field, but neither the Government nor industry are using the NQI systemically to deliver growth and productivity. That is what I would like to discuss today, so I hope that it is of interest.

The Chair: That was excellent, thank you. We have a lot more questions but that was a very useful introduction from you both.

Q153 **Baroness Willis of Summertown:** There are three parts to my question. The first one is for both of you. In your roles at the Regulatory Innovation Office and the BSI, how do you engage with the start-up community? Where is that link? Where are those conversations going on to really understand what it is like at the coalface and how you then bring about change?

Dr Scott Steedman: Engaging with the start-up community is an enduring challenge, particularly, as I said, because there is very little understanding. There is no education in the business schools in this country and very little in the universities, and the university enterprise zones do not have the skills or capability to explain this. Engaging with a community that does not really understand this subject is extremely challenging. Occasionally, we encounter innovative SMEs that want a standard for their invention, but that just illustrates their misunderstanding about what we are producing. We strive to make our catalogues discoverable to SMEs, representative organisations and industry associations.

In some fields there are good examples—trade associations and professional bodies are very good at making connections with us—but our primary pathway has evolved over the last 10 years through Innovate UK and the universities directly. A number of super universities have been interested in seeing this as a way to support their start-ups, and I gave Imperial College as one specific

example of that in my evidence. That is really how I suggest we do it. Through the Department for Science, Innovation and Technology, in the case of telecoms, AI and quantum, we have had good connections into the SME community. But “never enough” is what I would say. It is something that I would love to do more of.

Baroness Willis of Summertown: To follow on from that, I am a professor at Oxford and I also have a spin-out, but no one has ever mentioned to me standards and the BSI. Clearly, there are barriers to communication. Is there an obvious place to improve them?

Dr Scott Steedman: Korea starts teaching standards in primary school, then in secondary school, undergraduate and postgraduate, and then in business. It has gone from an agrarian economy to a global superpower in 40 years, and there may be some connection there.

I regret to say that that not a single business school in this country teaches standards and regulation as a tool for innovation or for growth and competitive advantage, so there is another gap there. Earlier in my career, as an engineer and academic, similarly, I am embarrassed to say, we did not discuss the role of standards as a tool for industry; we thought of them as something to do with compliance and rather boring. That is the challenge we are facing, but together we could really move the bar on this.

Lord Willetts: We at RIO have links to individual companies, often through the excellent work of bodies such as the Royal Academy of Engineering and the Royal Society, which host events with relevant members. For example, we had a great discussion on robotics that the Royal Academy of Engineering hosted, with real companies present. We also have links directly to the professional bodies that represent them; I had a good meeting with the BioIndustry Association the other day.

The third angle, which is very illuminating, is talking to internationally mobile and active investors. When you find a VC fund that has taken a view that it is worth investing in drone technologies or plant-based protein, they either say, as you hope, that they are keen on Britain or, alternatively, they say, “We are about to give up on Britain because the regulatory regime in Singapore and Australia is so much better. It’s not really worth putting the effort in here. Even if it’s a nice company, it’s going to take too long to bring it to market”. Those international comparators are very illuminating.

Baroness Willis of Summertown: On the Royal Society and the Royal Academy of Engineering, maybe you do not see this, but that

is dealing with people who are already established. Many of the SMEs that I see coming through are at an early stage, where someone who has just finished their DPhil wants to turn it into something bigger. How do you capture those people?

Lord Willetts: There are many reasons why we are part of DSIT. Our remit is particularly regulation as it affects technologies and innovation. It is helpful for us to be located alongside the technology groups inside DSIT, which themselves have links to the university environment. By that means, we meet and engage with particular companies, often at a very early stage.

Baroness Willis of Summertown: I was really interested to hear what you had to say about signposting for funding. Is there an equivalent that needs to be done for signposting for standards and regulation, do you think?

Lord Willetts: We can certainly do better. We have been trying to raise the profile of either individual regulators or—something we are very keen on—groups of regulators.

This committee's previous report on synthetic biology and engineering biology was incredibly helpful. Influenced by your committee's previous report, we have an engineering biology regulators network, which has now been identified. I think at one point the Government Chief Scientist, when being interrogated by this committee, confessed that she did not know who the members were and was not clear whether that information had been shared with her. Now it has been, and it has also been shared with the public. There is a website listing the 10 or so different regulators, with a contact email address for each one and a brief account of what they do. We could do a lot more of that kind of thing.

Q154 **Baroness Willis of Summertown:** How much can RIO co-ordinate the wide range of different regulators? In the engineering biology report, we found that people get so far but then had a regulation nightmare and hit a roadblock. As you know, it is across many different areas.

Lord Willetts: My view is that, if you accept the principle that it is wrong to have a single regulator for a general-purpose technology then you probably end up regulating them by application. If they are going into humans, you have a different regulatory environment from if they are going into the atmosphere. So potentially more than one regulator will be involved, and the groups of regulators are quite helpful. The original one was the Digital Regulation Cooperation Forum, which is an excellent body and precedes RIO, and, as I said, we now have one in engineering

biology. Once you have got them together as a group, you can then start tackling the real problem. What start-ups hate is a sequential process, where they think they have just got through one regulator and then there is another one. You can have a plan so that they can get a coherent guide, and if there are two different regulators involved then you can get them to do it simultaneously, and you can get data sharing. Then you can start making real progress.

Baroness Willis of Summertown: I have one more question. I read that you now have a sandbox for looking at regulation for lab-based meat, if I have read that correctly. How is that going? Is it starting to break down barriers in regulation?

Lord Willetts: Yes. We have funded an FSA sandbox on plant-based protein. I do not think it has finished yet—in fact, we are now proposing to fund a second one for the FSA—but I could not give you an exact statement of where it has got to. I hear good reports of its progress, but it remains the case that getting those products into the market in the UK is a jolly sight slower than in some global competitors.

Baroness Willis of Summertown: Do you see the sandbox as a way of speeding up that process?

Lord Willetts: Yes. The sandbox originated in financial services. To be fair to them, I think it was the FCA and others that trialled them. We are fans, and we use our limited budget partly to promote others. As you say, we are doing some with the FSA and I hope to do one on space launch.

What is important is that, at the end of the sandbox, real things then happen and people do not just say, “That was an interesting exercise”. There have to be substantive changes in regulation and far better guidance for entrepreneurs than before they started.

The criticism that I sometimes hear is, “We participated in the sandbox four years ago but nothing seems to have changed”. That is really bad news, and part of what we can do at RIO is to make sure that action is then followed up.

Dr Scott Steedman: I want to build on that excellent thought and pick up that point about space, which is one of RIO’s priority areas. The BSI is working with the UK Space Agency. Each of the standards that have emerged—fast-track projects—has a sustainable space community hub attached to it.

So, there are ways of doing this, such as the future flight work for drones and connected autonomous vehicles with the Department

for Transport, working together as a community of not just regulators but the wider quality infrastructure.

As I mentioned earlier, we have to look at the quality infrastructure as a kind of middleware between legislation, regulation and the market. As a community, we need to think of the quality infrastructure in its multiple parts and look at it as a systemic enterprise. In China, quality infrastructure is managed under a single state administration of market regulation, which is the largest agency in China after the police. That tells you how much they think about the organisation of their market. In the UK, we are fragmented.

On the point made a moment ago, the role of the approved bodies is an important part of helping innovators bring high-risk products to market in the UK. Think of notified bodies in Europe and approved bodies in the UK for medical devices. That is using the private sector to do that work as a kind of coregulator.

We think of legislation and regulation, and metrology. I also think of intellectual property, standards, TIC—testing, inspection and certification—market surveillance and accreditation. Those seven functions create a quality infrastructure. Navigating that is quite complex for a start-up that has never met any of this. One initiative we have taken recently is to say that, as they are not going to know the answers and as we are here to guide and help them, surely we should have a common national quality infrastructure shop window to which we can point people and say, “You may not know the question that you want to ask, but just introduce yourselves, tell us the outcome you want and are trying to achieve and when you think you want it in your business plan, and we will navigate the internal wiring as to what you might want to explore”.

The idea is to operate as a team coming together. There is an opportunity here. Perhaps, Lord Willetts, in a future discussion we could talk about RIO bringing together groups of regulators into a partnership. Our role as a neutral interlocutor is to try to have a helicopter view of that system. There is a lot more we can do together, and I like the idea of bringing people, groups and communities together. The problem is that they may not know the questions they are trying to get answered.

Q155 Lord Ranger of Northwood: I have a quick follow-up on those points. I think you are quite right, Dr Steedman. I know from my time in industry working in the transport sector, with rail safety standards boards, that there can be issues of culture, cost and complexity. I see that you are taking a progressive view to help on

the complexity side, but what about the cost side and the pace of change? Sometimes industry, especially smaller businesses or SMEs, feel that if they get involved with the BSI, it will just slow them down and therefore it is not a natural place to go. Are you looking at how that engagement could be improved?

Dr Scott Steedman: That is a really interesting area. We have done a lot of innovative work to try to respond to that. Perhaps I will say something a bit daring: we should not talk about standards at all; we should talk about processes. The BSI runs processes. We are most famous for the full international British standard process, which takes a lot of time and involves a lot of people, but that is the asset value it brings to national delegations.

We have innovated with the PAS system, which is a very easy, telescoped national standards process that is widely used by government and is easy for us to take into the international domain. There are some excellent examples where we have influenced global standards starting with PAS. Just before the pandemic, we also developed the Flex process, which is a more software development style of using “sprints”—an iterative process with a four-week cycle time. We are able to produce standards for piloting by small groups within four weeks.

I add that, in talking to our colleagues and friends in government, there has been interest in whether we could perhaps have a more adaptive process, whereby we run the governance but we allow a bit more direction from particular bodies—perhaps clients or the Government themselves—in areas related to security, for example, where you might want to be a bit more directive than having full stakeholder engagement.

Finally, in the voluntary carbon market, we offered to put the governance on someone else’s process in the UK national interest, by creating, in what was originally Mark Carney’s initiative in the VCM, a global system of standards for accreditation in the voluntary carbon market.

We have a lot of processes to offer. The key is to design the outcome that the scale-up community wants, and then we will put into that the tools that they need. In the built environment sector, we used a combination of British standard, PAS and Flex to get the community to the right space at the right time. There are lots of opportunities for innovation and, of course, the digital revolution is producing yet another transformation opportunity.

Baroness Walmsley: Lord Willetts has mentioned, more than once, the difficulty of convincing internationally mobile investors to

invest in the UK because of our regulatory environment. You have both talked about the various ways in which we are trying to improve that—co-ordination, reducing fragmentation, speeding things up and so on. What are you doing to disabuse those international mobile investors about what we are doing and how things are getting better?

Lord Willetts: I will give you an example that is very topical. London Tech Week was last week. Peter Kyle, the Secretary of State, was there and gave a speech, which was a shameless pitch for investing in Britain. I was pleased to hear that RIO was part of the litany of the great advantages that Britain has. I did several events at London Tech Week that were absolutely aimed at the investors, who were out in force. We told them that “if there is a specific regulatory reason that is holding you guys back from investing in the UK and leading you to invest somewhere else, tell us what it is. It is a complicated environment, so we cannot guarantee anything, but if we can do something about it, we will”.

Baroness Walmsley: Do you think that argument is landing?

Lord Willetts: I think it is, although we can always do better. It is tricky. I often get asked, “Can’t you be more like Singapore or Estonia?” I have even had a mildly cheeky approach from Estonia, volunteering to help out and advise on how to do these things—which is fine. Singapore is ahead of us on plant-based meat, so you might say, “Why can’t we do that?”. But there are no farms in Singapore; this is entirely a market access issue for products from overseas. Singapore does not have a mature agricultural system for which this is a big change. So, there is some of that around, but I would say that, by and large, they regard the UK regime as significantly better than average, although we need to raise our game further.

Q156 **Baroness Northover:** This question is on standards. We are focused here on the growth of the UK economy, which obviously includes what companies are doing here but also what British companies are doing overseas, bringing benefit back here. Clearly, the UK is very rigorous in standards and British companies adhere to them, by and large. As a trade envoy in Africa—I was also a Minister for Africa—I could see that that was not necessarily the case, traditionally, for Chinese companies, but they would bring in UK expertise to improve their standards. In fact, we were working with a centre in Beijing, where we were, in effect, transferring our expertise. I could see, from the companies that were operating like that in Africa, that the huge value of that engagement was going to China. A small value of it was going to the British consultancy

companies or whatever, which were involved in bringing those standards up. You see that transformation in the way that Chinese companies are now engaged in various places around the world and in the standards that they are following.

I am struck by what you said about the significance to our economy of the standards that you talked about, and I am expressing some scepticism. They are incredibly important for engagement in the United Kingdom, but I have seen how they have been used by others to their greater economic benefit.

Dr Scott Steedman: That was a very interesting thought and it goes to the breadth and spectrum of standards and other rules that are used around the world. I think of global organisations shaping standards—the UNECE and seat belts and things like that. China is very committed to the international standards system, and there is plenty of evidence of that. My counterpart in China is the Minister responsible for market access to China and, as he told me over dinner once, “Why would I want my industries to work to more than one standard?” The China Standards 2035 strategy is about critical and emerging technologies, and achieving a role in international standards that means that Chinese influence will impact those standards. It is exactly the same as the UK is trying to achieve in quantum, and the US and Korea; we are all at it. We are all trying to influence international standards, because they are adopted and used commonly and globally. They are the one common currency.

Of course, in individual countries where there are no international standards, people will use old national standards, industry association standards or some other class of standard. However, the ambition, which we see growing rapidly, is towards common international standards that are used and adopted everywhere.

I was talking to the Under-Secretary in UAE last week, and she said on trade negotiations with India that the UAE is already at 93% international standards. By “adoption”, they mean the withdrawal of conflicting old standards.

In the last 30 years, the European countries have successfully transitioned towards a single, identical standard used everywhere where there is a common need. We are on that journey together. The ASEAN countries, similarly, in the face of geopolitical tensions, are moving towards a harmonisation of their standards regime. The African countries have signed up to their African free trade arrangement; it will take some time, but they are similarly on a journey to address the regional standards that they have been using and to have a common set of international standards.

That will be accelerated hugely by digital transformation, which is happening now. We are on the cusp of that; we call it SMART standards and I think of it as the smart future of regulation, standards and assurance. It will be a great levelling up.

The commitment in ISO/IEC—I sit on the boards of both organisations—is to ensure that no country is left behind. Every standards body in those countries, as appointed by their Governments, will have the same digital content with the same international digital standards for them to exploit in their markets. This is an extraordinary opportunity—perhaps the biggest transformation in business information for 30 years, some say 50 years, since the PDF. That transformation, with digital product passports and so on, will move the game forward.

It is very much in the UK's interest to keep countries such as China in the international system. We do not want fragmentation; it would be very difficult and costly for us. Our influence is strong because of our integrity and the regard with which we are held by countries around the world. Standards are a big opportunity for us to use that influence to scale up our innovative and emerging technology.

The Chair: We have a question from Lord Borwick and then we will move on to industrial strategy.

Q157 **Lord Borwick:** What influence or authority do you have in RIO over individual regulators to keep them sensible? When starting a new business, one often comes across ridiculous suggestions by regulators, and, in essence, one ends up threatening to take it to the press until they go and read it. I had an original problem in 2004, when starting to make an electric vehicle; the transport authority said that I had to do a crash test and then turn the vehicle over to find out how much electricity leaked out of it. That was a long time ago, and we sorted it out by threatening to go to the technical press about it. In the current state, do you ever have a row with regulators or can you sort it all out, even at the cost of delaying the company while they sort out the idiocy?

Lord Willetts: Our aim is to work constructively with regulators, and RIO does not have some kind of super-regulator or separate legal authority—we do not have a different legal regime. What we have is a large amount of high-level political and ministerial support both from DSIT Ministers—I report to Patrick Vallance and Peter Kyle—and more widely. The Chancellor of the Exchequer had a round table, where she made it clear that the Treasury was looking for regulators to help ensure that it is promoting innovation and growth. We also have good relationships with other Ministers

who have responsibilities in their departments for particular regulators.

I find that constructive engagement gets you a long way, as does, in particular, turning up with real examples. Part of how we can add value at RIO is by acting as a shortcut. When there are specific companies that have a specific problem, we can say, "Hang on, how can you possibly defend regulation X? We really need to do something about it".

The regulation that all drones had to have a visual line of sight observing them was something on which we had a very good discussion with the CAA, promoted by Department for Transport Ministers. We are now getting exceptions to the visual line of sight requirement which enables drones to operate offshore, for example.

Our aim is constructive dialogue. Down the track, who knows what might happen? If we concluded after two years that we needed some kind of special legal regime, who knows what would happen? At the moment, I think we can make the current regime work better.

Lord Borwick: How long does it take to get regulation changed? Take the example that you gave of offshore drones.

Lord Willetts: It depends. A lot of this is surprisingly unpredictable. You encounter a regulatory problem and then you try to find out what the regulation is. It could be anything on a range, including a serious piece of text in primary legislation which requires amendment. In the lobbying for government time for parliamentary business, we certainly ally with the department that says that we need to amend primary legislation to tackle this problem. That is one extreme, and there are examples of that. At the other extreme, the problem is that the regulation is barely written down at all. It is just the custom and practice of a group of middle-ranking officials perhaps responding to some public pressure in the past. You can just agree that they should be taking different decisions, and that is that.

Alternatively, you could be more imaginative in how you interpret the regulation. In the drone regulations, there is already a provision for what is called atypical airspace. One of the things you can do is say, "Hang on guys, let's work out how much airspace is atypical". There is a lot of atypical airspace out there, where we can perhaps have a more liberal regime. You can find a way through something that is written down to promote much more innovation and flexibility than has previously been possible.

Dr Scott Steedman: I think the answer here is to see it as a system and to understand whether one is dealing with prescriptive regulation of the type that was just described—turning the car over—outcome-based regulation or performance-based regulation. This country works extremely well with performance-based regulation, which says, for example, “Do something safely,” and then can use other tools—standards, for example—in a co-regulatory manner or by earned recognition to prove the point. It is all about the risk model that one is prepared to adopt. Then the question is what type of regulation, and there is a lot of innovation that we can do there.

The Chair: We are going to move the subject to industrial strategy. Most of the questions for this next period might be for Lord Willetts, but we will come back to Dr Steedman.

Q158 **Baroness Northover:** You published a guide to how to do industrial strategy. We have an industrial strategy that is about to come out so I wondered if you could outline what you think are the key areas that need to be included in an industrial strategy for it to be a success. I should think you will be indicating that you think the Government might be addressing these, but I would like your comments on how it seems to be developing at the moment.

Lord Willetts: First, do not try to achieve authoritative completeness when you start. One thing is to do it step by step, and to say, “This is what we’re going to do with some particular technologies or some particular sectors. We can’t do everything so let’s get started here”. If there are then future omissions, or people think we should be doing something else as well, go for that. Do not think you have to have one final, complete, authoritative statement in a White Paper after which nothing changes.

My long-standing frustration—and where I think we are way behind the Americans—is public procurement. A new legislative framework is now coming into force. I hope the opportunities of that new legal framework for public procurement are taken as part of industrial strategy.

To insert a RIO angle, one of the striking aspects of NICE is that, if a medicine gets through the full health service regulatory process and is approved by NICE, there is then essentially an obligation on the NHS to use it. I do not think we could do anything quite as wholehearted as that but, if you have emerged at the end of our regulatory process, one of the ways I hope we can help with the procurement legislation is that at that point we can say to the public procurement agencies, “This start-up has got through an onerous process. It’s got a tick in the box and all the regulators are

saying it's fine, so it would be great if someone in the public sector actually started using it". Therefore tying in with procurement is my second point.

The third thing is more public/private partnerships, where you have to have a degree of flexibility. There are always unpredictable, interesting new angles, where someone turns up from abroad and is willing to make a big investment in the UK if there is a bit of public money alongside it, and you should be a bit opportunistic about when you do deals with them.

Q159 Baroness Walmsley: What areas of implementation of the industrial strategy should this committee look at to address some of the problems that you have raised?

Lord Willetts: There are the eight pillars, which are fine and useful. It is quite tricky knowing exactly where what we call deep tech fits in. Does it slot in under advanced manufacturing or under "digital, technologies"? There is a comma there because it is not just digital technologies—it is a bit tricky to understand. Is that pillar basically software, or is it supposed to be all technologies, or do physical technologies come under advanced manufacturing? Then you also want to add in life sciences as well. We want to be confident that, when we have seen the White Paper, we know where the innovators working in new general purpose technologies fit into the Government's programme.

Baroness Walmsley: How much does it matter where deep tech slots in?

Lord Willetts: What matters is that it slots in somewhere. We do not want it falling between the cracks. Someone who is innovating in batteries needs to know who takes the lead. It is not unlike the regulator problem. Is it the clean energy pillar, the advanced manufacturing pillar or the "digital, technologies" pillar? Someone, somewhere, ought to be taking the lead.

Q160 Viscount Stansgate: You will not be surprised to hear that we have been given a lot of evidence about the role of procurement, which you have touched on, and pension fund reforms as ways to help finance and scale up science and technology companies. What recommendations would you make in these areas? You have mentioned procurement, but any more that you have to say about that would be very welcome. In particular, what would you say about the Mansion House reforms—not so much their potential but the actual progress being made?

Lord Willetts: On Mansion House, there is a lively debate at the moment about whether there should be a 5% requirement. Having

it in the background is quite helpful. Some of the pension fund trustees will say it is quite a difficult decision to leave with them as to what is consistent with their legal responsibilities, and that a Minister saying they have to put 5% into high-tech industry, or however exactly it is defined, is better than leaving them to our own devices. I think there is a case for that.

There are some interesting City funds now investing in technologies—companies such as M&G—with very substantial funds. I welcome the increase in funding for the British Business Bank, and I hope that helps get more City investors looking at technological opportunities.

Viscount Stansgate: Is it the case that the people within some of these pension funds are afraid to be the first to take a major step in this direction, accept more risk, and invest more in science and tech companies?

Lord Willetts: There are several problems. One is that the defined-benefit schemes are ageing. I wish we had been able somehow to keep them open for new young members and make them proper intergenerational programmes, which would have kept them investing much more in equity. As they shift to being more for pensioners than for younger workers, defined-benefit scheme investment practices are becoming more conservative, while DC pension pots have MiFID-type regulatory regimes, which make them more conservative too.

One use of British Business Bank expertise is trying to put groups of technology—real economy assets—into a form that makes them investable by DC pensions complying with MiFID and by ageing DB, but that is quite hard to do. The Government—this began under Jeremy Hunt and is carrying on under this Government—are trying to get the City funds to do more, but the changing composition, age balance and regulatory framework for pension funds are currently heading in the opposite direction.

Viscount Stansgate: I notice Dr Steedman nodding.

Dr Scott Steedman: There are good examples at the other end of the scale, where investors have reduced their risk through a co-ordinated approach to regulation and standards, and there are some specific examples worth dwelling on. I could not comment further on the remarks that Lord Willetts made.

Q161 **The Chair:** I am going to switch topic and ask some questions of Dr Steedman about standards meetings. You have already articulated very well the important role of the BSI. Has that been

reduced since Brexit? Is the UK still able to send high-quality, high-level delegations to meetings? Do those meetings include entrepreneurs and innovators? Does the BSI have a role in helping entrepreneurs and innovators to sit around the table at those meetings?

Dr Scott Steedman: I worked for some time to ensure that the UK could stay within the European system. The BSI negotiated the full continuation of UK participation in the European regional standard system, which is a system of 34 countries, albeit that the Commission uses it quite heavily. UK involvement has not reduced at all since Brexit—I mean, there are some bits around the edges, but nothing significant. We have participation, the right to sit on committees and the right to run committees, and there are some good examples of where that continues. We had a plenary meeting of the Eurocodes committee, which is led from the UK, the other day in London. That continues.

On the policy side, we continue to have our influence in CEN and CENELEC, while in ETSI, the telecom standards body, there is really no change at all. That has been a source of success for our stakeholders; they asked for that and we delivered it for them, so everyone can participate in that process. There is no change to our position internationally that was caused by Brexit. We send high-quality delegations, I am delighted to say. We have around 14,000 people from across the UK—UK-based stakeholders who participate in standards making. Those committees, including about 200 international committees that the UK manages—the BSI is responsible for over 1,000 in total—will select the representatives to participate in international standards making. There is no barrier at all to entrepreneurs, investors and innovators participating in standards-making activity, and many do.

I suggest that we probably need more like 20,000 people from across the UK participating in this important work. I do not think that we have nearly enough for our ambitions globally and for the pressures that we are under. The idea of trying to bring more people in is really important and, as I say, we do our best to reach out to entrepreneurs and innovators to encourage them to participate. Often, they did not know about this. They say, “Could I really?” We say, “Absolutely. BSI does not make standards. Our job is to invite you to take part in the standards communities that you want to be in.” Hopefully, that is the right answer.

The Chair: That leads on neatly to Lord Lucas’s question.

Q162 **Lord Lucas:** I am a great supporter of what you were saying. I look back 40 years to when I was managing UK pension funds and

Britain was top of the telecommunications tree compared to where we are now. I put a chunk of that down to having dropped the ball on standards. Looking at where we are now, who needs to do more to make sure that we are really part of the international system and are seen by potential investors as riding the front of the wave, rather than floating around somewhere behind it?

Dr Scott Steedman: That was a super question. There are thousands of private interest standards organisations around the world—foundations, consortia and all sorts that pop up—and they can have a certain shelf life. Some of them are very important indeed. What is most important for the UK is that we co-ordinate our input in a strategic way into the areas where there are critical and emerging technologies and that we try to resource that and encourage the community to participate.

In the area that you mentioned, telecoms, I think that it is well accepted that the UK, along with the US and other countries, dropped the ball on standards some 20 years ago. That was due to a loss of interest at a governmental level, so industry was allowed to do it itself completely. That led to all kinds of challenges, which we have had to try to address in the last few years as it has become clear that industry left entirely to its own devices, without good governance of the standards-making process, will inevitably create trouble. This is particularly in terms of the standards and their use of intellectual property, not to mention other practices that have caused problems in the telecoms and connectivity world.

Co-ordinating our input is the number one thing. Bringing on the next generation of young professionals, postdocs and the whole community who need to join in, get out there and influence is critical. There is a perennial problem that people rightly raise about the cost of travelling to international meetings and the assertive stance that some countries are taking, sending large numbers of experts because they know that, if they can control the standards, that will help their own industries. We take a slightly more traditional approach, but I think that we could do a lot more to get more joined-up on what outcome we want as a nation.

An excellent example of this is the national quantum strategy. Along with us as the national standards body, NPL as the national metrology institute went out to secure the first joint international committee on quantum technologies. Our friends in NIST—the National Institute of Standards and Technology—said that the US did not really want that. They wanted it. China wanted it and Korea wanted it, but we secured it for the UK. The first joint technical committee on quantum—JTC 3—is now up and running and the UK runs its secretariat. That is a strong and good example but, behind

that policy success, we have to have the technical experts who will go in to the committees to deliver the goods. Much more co-ordination across DSIT, DBT and other departments that have international standards interests would be helpful.

Q163 Viscount Stansgate: That was helpful and leads to a question that I want to ask. We obviously have some research infrastructure, such as the NPL, which can be used for metrology and standards. Although I am very interested in what you have just said, we have heard evidence in previous inquiries about barriers to access for start-ups and early-stage companies that want to use these facilities. Obviously, on the quantum front, things appear to be going well, but in other areas not so much. What would you recommend the Government do to address the problems that exist in accessing facilities such as the NPL and so on?

Dr Scott Steedman: I hesitate to speak on behalf of the NPL. You would have to ask my colleague Peter Thompson for an answer to that. Its work and, in particular, its facilities are world-class and it uses them for a lot of activities. Its focus on standards is, of course, what we used to call physical standards—such as the kilogram—and measurement is an absolutely crucial part of government function. To return to the standards space—I am more familiar with that stakeholder world—we do not have any barriers to access that I know of, so I think that this may be a question for the NPL.

The Chair: We are running a little late, because we have so many questions for you both. Our two witnesses for the next session are here and I hope that they will bear with us. We are probably going to be another 15 minutes or so, if that is all right. We will switch to the subject of resourcing for regulators and questions for you, Lord Willetts, about that.

Q164 Lord Lucas: You said, when talking about engineering biology, that regulators need more resources. How achievable do you see that being? In terms of regulators helping to improve rather than just restrict, how do you drive improvement and accountability?

Lord Willetts: I think that what I was observing was that, in almost every conversation that I have had with regulators about high tech and innovation, they say, “We completely agree with you. We would love to do more. If only we had more resource, we could recruit more experts at the cutting edge. If you could find your way to help us get some more money, we can really work together.” There has been an element of that in almost every conversation that I have had with the regulators.

There are several things we can do about it. We have a modest funding capacity for where we really think that the regulator is hard-pressed. I have only been doing this for three months, but I think that there was a view that the Food Standards Agency was overwhelmed with post-Brexit work and creating a domestic regime. We have put in extra money for some of the work that was needed on plant-based protein.

You can also exercise some influence on prioritising. You can ask, "Isn't it possible to shift some staff around so that you have greater capacity in the new area, because it is so important and the Treasury attach weight to it?" I suppose down the track, although we have not cracked this and it would be interesting to have the Committee's advice, we can ask, "Are there some ways you could imagine private sponsorship of some of the functions? Can you handle conflicts of interest on that kind of thing?" Those are the kind of things that can be used to make things happen. Most regulators now have some public accountability, but we can definitely talk to them about what they are doing in the areas for which we have a specific remit, in technology and innovation.

Dr Scott Steedman: In my experience, regulators are very focused on their regulatory bubble—the umbrella that they are dealing with. If we thought of regulation as a broader, more fluid and flexible sort of concept that was based around performance and outcome rather than prescription, it might be much easier to find different ways to address the risk of any new emerging technology to the public or to the environment. Of course, we have the approved body structure, where we are using private sector experts to do regulatory tasks. So, there are other tools as well; that is my point: we need to see the regulators as part of a community that is addressing the risk of these new technologies and how we manage it.

Q165 Lord Stern of Brentford: My question picks up on what has just been said about resources and outcomes. The next 10 years or so will be decisive in relation to climate and biodiversity. What we invest will shape whether we have any chance of holding below 2 degrees—we have gone up by 1.5 degrees already, but we can get it back down—but the point is the urgency. We need a lot of innovation and investment in the next 10 years, and regulations and standards will influence that. To make life more difficult, we are discovering more and more about toxicity and the way in which different kinds of chemicals appear in the environment. We also have a whole wave of complexities around AI and so on.

The combination of the intense urgency and the complexity must make your lives more difficult. However, the answer to that cannot

be, "Give us a bit longer and we'll sort it out", because of the urgency of the problem. How would you respond to that? I know it is a rather broad question, but this is an intense and cutting-edge problem.

Lord Willetts: I should have said at the beginning that I am a great admirer of what the BSI does and what Scott Steedman does personally. We are important allies in all this. I very much agreed with what Scott said earlier about international partnership. Many of the issues that you described are not unique to the UK. We can do more by way of pooling information and resource and, sometimes, just going for mutual recognition of other countries' regulations. Post Brexit, those types of alliances are probably even more powerful, and we can do more to build them up.

Dr Scott Steedman: Thank you, David. May I build on that? At COP 26, we realised that one of the fundamental problems we had, from an industry perspective, was that there was no definition of net zero. We therefore led an investment, which was directed by the BSI, to create the net-zero principles. They are now becoming the international net-zero standard, which will be a certifiable standard. That is what the international community want.

The net-zero principles were delivered through a workshop process in six months, engaging more than 1,200 people from 100 countries, led by the BSI on behalf of the UK. That was an astonishing achievement. The UNFCCC said at COP 27 that 26 COPs had failed to do what we did in six months. When we mobilise, we can do things very quickly.

Another very important development, which has happened in the last six months and is still moving, is the coming together of sustainability reporting standards. I call them industry standards because industry uses standards that generate the data that we need to measure and understand our progress towards the net-zero transition. The two worlds of financial reporting and industry reporting have been separate for 150 years, but there is now an alignment of the measurement of sustainability reporting standards. To come up with a common concept for the GHG protocol, the ISO standards are coming together with GHGP, and we have the SBTi and so on. We are beginning to bring all that together, with the ISSB, to ensure that we have alignment. It has taken a lot of policy work and engagement to make that happen. The alignment of financial reporting and industrial standards could unlock quite a lot of progress.

On the technologies themselves, I cited future flight, but I could have cited hydrogen and all sorts of advanced technologies that are

being developed in the UK and globally. We have talked a bit about quantum already, where we have been using very fast-tracked tools—the four-week Flex process and the PAS process of a matter of months—to pilot new ways of doing things. As Lord Willetts said, part of my role in the international policy arena is to influence the ISO, the IEC and the ITU, and at the European level, and to offer even faster-tracked, more consortia-style standards platforms. We are in one sense quite a small country, and we all know each other, so would it not be exciting if we had a systemic approach to consortia-style standards, where we were even freer of the governance than we are in the formal system?

There is a lot of action here, Lord Stern, and some really good progress being made. I have seen in some European nations but also in developing countries a very strong commitment to use the international standards system. Because it is common to so many countries, it can achieve change at a much faster rate than trying to change 120 regulatory jurisdictions.

Q166 Lord Ranger of Northwood: David, many of us welcomed your role at RIO. You mentioned at the beginning that Lord Vallance is perhaps doing more than you did or achieved in your time, but with you two working together, perhaps we can achieve more. You described how he is focusing on, among many things, the clarification of agencies that provide funding—the research councils, Innovate UK, the British Business Bank, et al. Could RIO be a front door to the regulator—or part of another organisation that is a front door—to which businesses can go if they are looking for guidance on regulation? Could you potentially be that clarification point for those businesses? I know there could be a case for saying, “Stop doing what you’re doing”, but I mean it more as an advisory position, where you then funnel them back into the regulatory environment. As you were speaking earlier, it occurred to me that it sounded as though RIO could almost be the Cabinet Office for Whitehall in the regulatory world. I say that in a positive sense. Are all roads leading to RIO?

Lord Willetts: It is very good of you to offer us that wider role. Of course, we are in DSIT, but the DBT is the overall regulatory body, and we have a specific remit on science and tech. If people have a problem with planning law, that is not for us; we try to focus on technology. We are quite a small, low-cost operation. At the moment there is no single, easy front door where people can just go to a website and leave us a regulatory problem that we then engage with. That would be an increase in our role, and we do not have the staff or capacity to do it.

As I said earlier, what we are doing at the moment, which I think really helps, is trying to get the groups of regulators in an overall area working together and being more accessible. As I said, digital is the original area and there are several others now emerging, most recently engineering biology. We can play a constructive role in helping to bring groups of regulators together, agree guidelines and perhaps find a lead regulator. That is where you currently find the front doors.

Lord Ranger of Northwood: Dare I say, then, that you may just be hearing half the conversation? Obviously, you will hear the regulators' conversation, but not the challenges in industry. Perhaps you need both voices coming in.

Lord Willetts: Yes. I may raise specific business problems that specific individuals raise me with the relevant regulator or group of regulators.

Dr Scott Steedman: We have an important part to play to support RIO. There is no limit to the breadth that we can cover through the national standards body and our colleagues—we mentioned earlier the NPL, the national metrology institute. Together, this would be a very strong bolstering of that idea of the "Cabinet Office for regulation". There are some very good examples in the built environment sector and competence, where we worked as a group. Our role as a neutral facilitator was to bring the industry to the table, along with the regulators, including future regulators who were just finding their feet at that time, the department, industry and the standards and accreditation community in order to create that kind of outcome-based approach. We found it very successful. If we can identify what the problem is and the outcome that we want as a country, we can quite quickly get to the better regulation outcome that we need.

Lord Ranger of Northwood: I would like to conclude this point by saying that, as someone who has been in industry for most of my career, my request is to keep that navigation as simple as possible, because that is the challenge that everyone faces.

Q167 **Baroness Young of Old Scone:** This question is for Dr Steedman. As an ex-regulator in various fields I am a great fan of standards. Do you think you are getting evidence and examples yet of your standards work, or the international standards work, being used as a check by potential investors about their wish to invest in particular technologies or firms? Similarly, do you have any examples of it being used by the Government in their procurement process?

Dr Scott Steedman: Yes. It is hard to tease apart the causal relationship between the role of standards in emerging tech and investor trust, but there are specific examples. I gave one in my evidence around compostable plastics, where there is a very clear story about the need for a test method and the fact that a start-up company that spun out of Imperial College has gone on to become a global company within a few years. That is a good example.

We have examples in the autonomous vehicle space, where British tech companies have attracted considerable investment and been heavily involved in the development of standards to support their tech and bring it to market faster, which is of course what we are trying to do. There is also an interesting standard, PAS 808, which is on purpose-driven organisations. Anglian Water was interested in that and helped to set it up, and it successfully used that standard to attract investment. Those are some specific examples.

The very best example that I can give you, which is a whole case history of government procurement, is the building information modelling work, which was a technology that emerged about 10 years ago. I remember being in the room when the Government BEIS, as it was then, basically told the industry, "Either you work out a single system of interoperable data standards for the construction sector or we will do it to you". So the industry led the way, and we overtook the Norwegians, who at that time had taken the building information modelling world. That BIM standard, PAS 1192, is now pretty well 100% used in the infrastructure industry sector in the UK and has become the global standard ISO 19650. That is another example of where UK best practice has gone around the world, and it was government procurement that led that to happen.

We could see much more use of procurement as a mechanism for encouraging risk appetite and encouraging start-ups to take more of a step to scale up, which would be very exciting.

Baroness Young of Old Scone: Do you see any signs of that actually happening?

Dr Scott Steedman: I do, in limited areas where there are specific technologies that are trying to come to market, but I would like to see it much broader than that. We have been working with Innovate UK: we have the business toolkit, fantastic "Innovation Days" and a LinkedIn community—I appreciate that it is not in the thousands, but it is bringing innovation managers together around the value that the standards will bring to their tech companies, and it is growing. That has been a great step forward. It has taken us

10 years to build a partnership with Innovate UK, which is leading to these new contributions to the SME community.

Baroness Young of Old Scone: Is there any risk at all that engagement too early with standards work constrains and channels people towards common views rather than thinking outside the box and finding wacky, zany, off-the-wall solutions to problems?

Dr Scott Steedman: That is a common thought and a very good one to air today. I would say that if you are rowing a boat then you need to row at the right speed; you cannot just pull the oar a bit faster or slower than the next person. If you want to accelerate then you need to do things at the right time. Typically at the early stage—early TRL—people are interested in terminology, so they ask, “Do we have a common understanding of what these terms mean?” We are not setting those in regulation; we are setting this in a document that people can iterate and evolve over time. Standards change the entire time. Most of our work is on the revision and updating of standards. For example, our PAS standards have a shelf life of just two years, so they will be constantly improved.

There was a classic example early on, back in the day of plastic electronics, where they had not gone to the standards community early enough and they ended up with a terribly slow process of trying to work out what they meant when they were sourcing raw materials and building a supply chain—they could not do it.

It is possible that the same community could write something that tied them in knots, but I suggest that that is a bit unlikely because, when a community has come together to agree something, that is what they wanted to agree, and they can change it the day it does not work for them. The main thing is that they got in a room together.

Take the Flex process: they produce something, and they then take it away for four weeks and try it out; four weeks later they come back and do another sprint, and if they do not like it then they change it. Standards are not about making things the same; they are about helping people to reach a consensus, at that point in the innovation cycle, on what they want to agree. That is the name of the game.

The Chair: We are, unfortunately, going to start winding up this interesting and informative session.

Q168 **Baroness Neuberger:** This has been fascinating from both of you. We have to write a report and make recommendations to the

Government. If you were writing our report—and in a way, Lord Willetts, you are in government, so you can give us quite a lot of clues on this—what would you be saying? I want to pick up the procurement point in particular. I thought it was brilliant when you talked about the NHS and NICE. We have just had an example of NICE approving Alzheimer's drugs but saying they are too expensive for the NHS, so it does not always work like that. I also like Dr Steedman's point about convening and bringing people together, which I think is really impressive.

Lord Willetts: On procurement, I think we have an inferiority complex. People think, "If it comes from the west coast, it must be better". A lot of these west coast technology companies overpromise: they propose to government departments things that they would like to be able to do in a few years' time, rather than things that they can actually do now. UK companies are often much more rigorous. Do not believe every promise from a west coast technology company.

I have been thinking about regulation, particularly in my RIO role. We need to look at opportunity cost and have a framework of comparative economic analysis. On drones, for example, one fact that I do not think is currently regarded as a relevant consideration for the CAA is that the biggest single cause of workplace accidents is falling from a height; 50 people a year fall from a height. If we were using drones to inspect things—to check out the state of tall buildings or the state of blades on a tall wind turbine—I would hope that we could reduce that, but putting that consideration into the regulatory assessment of a drone is surprisingly hard to do in the current framework. The case for innovation is that it is often in a different neck of the woods that you have a gain.

Baroness Neuberger: You are saying that government needs to think a bit differently.

Lord Willetts: Yes.

Dr Scott Steedman: I would also say that government needs to think differently. In fact, I would like us all to think a bit differently about standards and regulations. Combined, and used in that intelligent way, where we think of performance and outcomes rather than prescription, they are a vital tool to drive our success.

We are pretty good at convening; it is a role we take very seriously, particularly when there is an issue or an outcome people want to address—a burning platform, perhaps, that we need to tackle. But we would be a lot more successful at convening and solving issues if, as Lord Willetts generously said—he is a very

capable convenor himself—we were able to convene together, and if the Government were able to lean in and endorse that and say, “Listen, you all need to get together and sort this out. Come up with an innovative way to regulate this issue, and we will give some latitude and reward”. The BSI, RIO and the national quality infrastructure, with the Government’s arm around our shoulder, whether that is DSIT, DBT or whichever department actually has the issue, could go in together and convene a strong outcome, using industry leaders, academic experts and stakeholders—that is, the consumers who are going to be affected by these issues, because it is important they are in the room too. We have techniques for that, but we would love to do it in a more joined-up, coherent way.

The Chair: That is a good point at which to conclude. We hope that the two of you, in your two different organisations, get together as a result of this meeting today. We thank you very much indeed for your excellent evidence.