

Science and Technology Committee

Oral evidence: [Work of the Science Minister and Government Chief Scientific Adviser](#), HC 1826

Wednesday 30 January 2019

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Members present: Norman Lamb (Chair); Bill Grant; Mr Sam Gyimah; Stephen Metcalfe; Graham Stringer; Martin Whitfield.

Questions 114 - 192

Witnesses

I: Chris Skidmore MP, Minister of State for Universities, Science, Research and Innovation; Sarah Redwood, Deputy Director for EU Science and Innovation Programme, Department for Business, Energy and Industrial Strategy; and Jenny Dibden, Director, Science, Research and Innovation, Department for Business, Energy and Industrial Strategy.

Examination of witnesses

Witnesses: Chris Skidmore, Sarah Redwood and Jenny Dibden.

Q114 **Chair:** Welcome, Minister. It is very good to see you. Congratulations on your appointment, and good luck in your new post. Perhaps we could have a quick introduction, including your colleagues.

Chris Skidmore: Jenny Dibden is the director of science, research and innovation at BEIS, and I have been working with Sarah covering EU exit negotiations.

Q115 **Chair:** In the speech you made last week at Culham you talked about your two key priorities being Brexit and the 2.4% of GDP target. Are there any other priorities, or are you focusing on those two?

Chris Skidmore: In the immediate term, providing certainty and stability for the science community on Brexit is my No. 1 priority. Turning to the context of the spending review, I am working hard for the best possible settlement for science and technology.

There is another priority that is very relevant in the context of 2019: mobility and ensuring that the UK remains the best possible place for international researchers and scientists to participate in research and innovation.

With the immigration White Paper published in December I am keen to continue to build the case, as already outlined in the White Paper, that we are an open country. We have made a clear statement on ensuring that we have no cap on international students, but I want to go further to ensure that the £30k cap on salary can be seen as quite detrimental for the science community. Through a process of working with external stakeholders—the academies and universities—I am trying to ensure that I can build that case and make it clear to the Home Secretary.

Q116 **Chair:** To remove the £30k cap.

Chris Skidmore: To look at what alternatives there would be to the £30k cap. I have commissioned work by Sir Patrick Vallance, chair of the Government Office for Science, to look at modelling around £30k.

It is very clear to me—I have been in the job for only seven weeks—that when you look at the needs of research communities to bring research investment to the UK, it is not just about the money; it is about ensuring that research teams, which may already have built up homogeneity right down to the laboratory technicians, have the opportunity to come to this country, and you are looking at average salaries of £19,000 a year upwards.

Q117 **Chair:** You recognise that the £30k cap excludes quite a lot of people.

Chris Skidmore: Exactly. I want to make that case, whether there is a carve-out for science or we need to ensure there is a position that



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recognises it. That is important for researchers and their families. When you look at particular areas like Culham, or some of the areas around Cambridge, some of those research teams can comprise upwards of 70% international researchers. Obviously, they have wives and children.

Q118 **Chair:** Or, indeed, husbands.

Chris Skidmore: Yes, husbands or partners, but the important thing is that these families also need to be taken into consideration. I want to make the case that we need to provide that stability and security as well.

Q119 **Chair:** When you receive representations from the science community, how would you describe the level of the concern expressed to you about leaving with no deal?

Chris Skidmore: It is quite clear that a no-deal scenario would be extremely detrimental to the science community. We know that long-standing partnerships sometimes extend beyond our partnership with the EU and ESA. We are leaving the EU, but we do not want to break those long-standing ties; we do not want to leave the European framework of science.

When we look at Horizon 2020, we have provided underwrite guarantees, but, going forward and looking at the future of Horizon Europe, we are at a crossroads. It is important to look at how we invest in the future. It is not just about the money; it is about continuing those partnerships at European and international level. I am keen to make sure that we have an ambition to associate with Horizon Europe and look at the value-for-money circumstances. The circumstances and regulatory framework for Horizon Europe have yet to be decided, so there are a lot of hypotheticals here, but I go in to bat as the representative of the science community to make sure I can do my best to deliver on certainty and continuity.

Q120 **Chair:** Do you see it as a very high priority to ensure we are part of Horizon Europe, the successor programme?

Chris Skidmore: When it comes to Horizon Europe, we also have to take into account the timeframe of what we are working on now. This might extend beyond 2019, working towards potential association. I will be going to the EU Competitiveness Council on 19 February. I have already begun bilateral conversations with Carlos Moedas, the EU commissioner, and my German and Czech science counterparts. I am also having international conversations. Half an hour after this meeting I will be speaking to my Japanese science counterpart.

I want to be able to send the message that, when it comes to Horizon Europe, if the conditions are right, we would seek to look at associating, but that will take time. We have another Competitiveness Council meeting on 3 April, which we may or may not be invited to. I have requested an invitation from Carlos Moedas to see whether that might be possible under the Romanian presidency.



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We are then into a cycle of European Parliament re-elections and the Commission disbands, so we are getting into November 2019 before we can get back into the details of association for Horizon Europe.

Q121 **Chair:** Presumably, there is a risk of a hiatus, with the uncertainty that goes with it, with decisions having to be made by research collaborations about applying for funding and so forth. Do you see as a risk the period during which we will not know whether we will be part of the successor programme?

Chris Skidmore: That is why it is important that we are looking at strong domestic alternatives for funding. That is part of a case in the spending review as well, looking at potential international research funds.

On stability and security, one of the first things the Prime Minister did was to make sure we gave a guarantee on Horizon 2020 funding. Then we had the underwrite extension beyond that.

I think that sends a very clear signal that we have reached a point where we are leaving the European Union, but we do not want somehow to stop the world and get off. While we are at this crossroads, we need to ensure that the future is placing our hope in science and technology. We are world leading in many sciences—fusion, quantum and AI. The world-leading respect that the scientific community has for the UK needs to continue, which is why, when you look at these priorities, they all join up in the round. We need European stability going forward as an immediate priority, and then we have the 2.4%, which sets the direction of travel for the commitment to future research funding.

Q122 **Chair:** I want to come to the 2.4% in a moment. Do you have in your mind some clear achievements that you want to secure over the course of the next year?

Chris Skidmore: When it comes to looking at the spending review, you will need to judge me on whether I am able to go to the Treasury and come back with a positive case, as I set out in my Culham speech. We will need extra public investment. This cannot be done by private investment alone. Our R&D spend at the moment is 1.67%, of which 0.67% is public spend.¹ To get to 2.4%, we are just baselining the OECD average, so making sure we get a strong settlement in the 2019-23 CSR period is absolutely vital.

Q123 **Chair:** Are you going to follow the Prisons Minister in saying that you will resign if you do not secure it?

Chris Skidmore: No. With respect to the Member for East Surrey, I want to ensure I can provide the stability and certainty of knowing that I will be the Science Minister for the course of 2019.

Q124 **Chair:** You see it as vital that you secure a deal as part of the spending

¹ Witness correction: 0.67% should be 0.5%.



review that gets extra public investment in order to secure the 2.4%.

Chris Skidmore: The Culham speech is the beginning of a campaign to set out why we still need to have that investment in this spending round. We cannot battle over this into CSR 2023-27, because by that time the research teams will have left. We need to provide that commitment going forward.

What does the trajectory look like? We want to try to demonstrate that this is not just about investing in big science and new infrastructures, of which there are some exciting examples; it is also about building the case. The important thing to recognise is that we are not going to make 2.4% unless we still have the research teams able to do the research in the first place.

Wearing my other hat as Universities Minister, we are building a case for upskilling our postgraduate investment, on which the UK does poorly. We have a low rate of postgraduate attainment beyond undergraduate studies. What are the conditions we need to ensure we can help postgraduates and early career researchers going forward in order to populate the research communities we will need to be able to work on the investment of 2.4%?

Q125 **Chair:** But you are clear that we will not hit the 2.4% unless you get the uplift in public investment you are after.

Chris Skidmore: When we look at where we are at the moment, every £1 of public investment generates about £2.60 of private investment.² That is relatively strong. It is not as strong as in places like Israel, for instance, but I am interested in looking at how we can leverage more investment from the private and charitable sectors into R&D, but we will need to have additional public investment going into the spending round if we are to hit 2.4%. That is my mission for this year.

Q126 **Chair:** I am conscious that the Treasury explored whether the prudent investment rules on pension funds and so forth could be tweaked to unleash private investment in R&D. Do you know where that has got to?

Chris Skidmore: I am afraid I do not.

Q127 **Chair:** Will you explore that and write to us to update us?

Chris Skidmore: Yes.

Q128 **Chair:** The argument we received in evidence was that a similar tweak in prudent investment rules in the United States had unleashed a significant amount of private investment for R&D. I think you are also going to publish a road map, are you not?

Chris Skidmore: Yes.

² Witness correction: this should read "for every £1 of public investment there is about £2.60 of private investment".



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Q129 **Chair:** Will there be options within that road map about routes to get to 2.4%, or will it be a clear single trajectory?

Chris Skidmore: Various road maps are being published. The first one, from UKRI, will be an infrastructure road map, which will highlight what we do well and where there are deficiencies in our R&D infrastructure and potential.

The road map that will focus on the Government side of the 2.4% will probably come after the spending review, so we will then have the knowledge of where we have to go to hit the 2.4% by 2027.

Q130 **Chair:** Will it also include the trajectory beyond 2.4%? You made the point earlier that all this does is get to the current OECD average, which may well have shifted by the time you get there. Of course, there is the ambition of 3%. Is there going to be a serious road map to get to 3%, or will it still just be a vague ambition?

Chris Skidmore: I believe the framework of the road map is to 2027, but I would be keen for us to continue to look forward across the horizon to 3%. As to the point you make about how we can open up a supply side, as it were, by leveraging further capital, we would welcome the Committee's views going forward.

Q131 **Mr Gyimah:** It would be helpful to get clarity on the public investment part of the 2.4% and whether you see that including or excluding our potential association with Horizon Europe. With respect, I have been in your position for so many of these discussions. What is the realistic assessment that we can associate to the full extent we would like to? I think it is worth our understanding that.

Chris Skidmore: Congratulations on your recent promotion to the Committee.

Mr Gyimah: I am delighted to be elected to the post.

Chris Skidmore: There are challenges around full association with Horizon Europe. As you know, we have already seen with some of the other issues around the ERICs that we are trying to ensure we have full influence. It is problematic, and there is an obvious question around voting rights and non-voting rights and to what extent we view voting rights as being essential to continuing to participate.

Q132 **Chair:** What is your view?

Chris Skidmore: My view is that voting rights are not essential if the programme itself and the regulatory framework that has been established ensure that it is favourable to us. The partial general approach approved on 30 November last at the Competitiveness Council demonstrated that these would be conditions favourable to our association. I am confident that going forward we would want to look at that association in the same way other countries have been associated with Horizon 2020.



It is also important to look at the ability to make sure there are no top-slicing potentials in Horizon Europe and that the fund established for the next seven years does not somehow get directed into priorities that may not be ours; they must focus on excellence in research.

Q133 Mr Gyimah: What I and the Committee would like to know is whether we are likely to be a third country with bargain basement Horizon Europe-type association, or are we going to have association to the full extent, bearing in mind we know it is not all down to us; it is down to the EU as well?

Chris Skidmore: That is the key point.

Q134 Mr Gyimah: Given where we are now, it would be helpful to know, since we are leaving on 29 March and it is still to be negotiated, the UK Government's understanding of the likelihood of association.

Chris Skidmore: The discussions and the ability even to get into the weeds of association will not be possible until the regulations are agreed. That is the reality about the timescale. We will not even have the opportunity to begin those conversations. You know the frustrations around the negotiations on Horizon 2020. We are in a Catch-22 situation. Until we have certainty about where our own position is with a deal or no deal we do not have the ability to negotiate with the Commission at all.

Q135 Mr Gyimah: In a previous evidence session we heard a lot about the underwrite, which does not apply to ERC and MSCA. I would like to get your view on how we are progressing with a domestic alternative to those.

Chris Skidmore: Maybe I can lead off and Sarah can come in with more of the details on how this is going to work over the coming months.

We have begun discussions with the high-level group with which we have regular meetings with the universities and the national academies to scope out their willingness to look at alternative funding arrangements. I had a separate meeting with all four of the national academies to discuss their willingness to take forward work on domestic alternatives to ERC and Marie Skłodowska-Curie actions.

As a new Minister, I am struck by the fact that, yes, we are in difficult territory, but also by the optimism of the science community and its willingness to look at new innovative solutions, which suggests this is not seen as a second-class option. There is genuine enthusiasm that there is potential for creating a new fund.

The question is whether it would sit under the UKRI umbrella or separately from a UKRI structure. Work needs to be done to look at which alternative funds would focus on infrastructure and excellence, and how you develop that prestige. The key thing about developing prestige in the science community is that ERC grants are so prestigious because they are run by and for the science community and are separate from interference



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by politicians and Government—and they have that badge of mutual respect and honour.

How we look at developing that will be quite critical. The last thing I want to do as Minister is to come in and say, “This is the departmental fund we are now establishing,” and place on top a layer of bureaucracy that would not necessarily reflect how the science community would want to reward what it views as future excellent projects. I do not know whether Sarah can go into some of the detail. It is early days.

Q136 Mr Gyimah: It would also be helpful to know whether the funding for this is part of the spending review work that has been done.

Chris Skidmore: It will be key. When we look at any potential new fund, that will have to come into the envelope of the spending review. Work is being taken forward on what the modelling might be to look at this.

Q137 Mr Gyimah: There will be an explicit bid for this.

Sarah Redwood: The Minister has set out what our longer-term alternatives would be to Horizon Europe, if we chose not to associate. We have also been doing a lot of work to look at what the replacements would be on the day of exit from Horizon 2020 for ERC and the Marie Skłodowska-Curie actions and the small and medium enterprise instruments.

I very much agree with UKRI’s assessments presented earlier this morning: it is on track but it is a huge challenge, and decisions are yet to be made on funding.

Q138 Chair: We are awaiting decisions on funding from the Treasury.

Sarah Redwood: This is for Horizon 2020 and day one of no deal. The evidence UKRI presented shows that there is a lot of work under way to work out exactly what those processes would look like. We have also been engaging with the wider community, with universities and representatives, to understand their real concerns and how we make sure that the system will be as smooth as possible to manage that transition.

Q139 Martin Whitfield: We looked at the Horizon underwrite in the first session. I want to pick up a comment made by Newcastle University about a reference it received from the Cabinet Office that the guarantee applies to all EU programmes until the end of 2020. Newcastle University was told that some of the EU programmes would not be covered. Are you able to identify which are covered by the underwrite guarantee and which are not?

Chris Skidmore: As far as I am aware, the underwrite guarantee and extension provides the funding for all Horizon 2020 programmes currently agreed up until exit day and any programmes that are in negotiation and are about to be approved pre-exit day up until the duration of the project, even beyond December 2020.



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I imagine that the individual grants that you mentioned in Newcastle would cover the so-called mono-beneficiary grants that at the moment are not netted under the guarantee: the ERC grants, the Marie Skłodowska-Curie grants and small and medium-sized enterprise instruments. I am fully aware of this and have been working at speed to ensure that I can get from the Treasury an extension to the extension, as it were. I am keen that we have the entirety of the Horizon 2020 project process covered. Letters have gone to the Treasury from my Secretary of State and we are awaiting a response.

Q140 Martin Whitfield: Will that information be available by the end of March?

Chris Skidmore: Yes. I want this to be resolved as soon as is feasible.

Q141 Martin Whitfield: To the various institutions seeking the guarantee in case of a no-deal scenario, you can say that at least that small bit of the cog will be answered before we leave.

Chris Skidmore: Yes. The key here is that it is unlikely we would be able to associate to Horizon 2020 because there is not enough time, so we need the entirety of the project in Horizon 2020 to be guaranteed in the underwrite process. That will ensure we have the stability without having to look at associating, because by the time we began the association process we would have about two months left of Horizon 2020, if anything was secured. Therefore, it is absolutely logical to make sure that the level of all the grants within Horizon 2020 is covered.

Q142 Martin Whitfield: I read somewhere about applications "in flight." Does that mean my application is in, or my application is in and you have looked at it and will come back with your decision? Are they safe, or will we have hundreds of scientists rushing around with applications in the next 48 hours?

Sarah Redwood: We are aware that a number of calls are still open, particularly some of the ERC grants where there is a window shutting on 8 April. We are trying to have discussions with the Commission to understand exactly how it is intending to act and whether or not it will have taken a decision on those. We are working very closely with our delivery partner UKRI to ensure we have processes in place for those applications that are "in flight" so that we have as smooth a transition as possible and minimise the bureaucratic burden on those applicants.

Q143 Martin Whitfield: For the ones that will be picked up, that is sort of fine. What about the ones that will not be, but were in? What future do they have under domestic funding?

Sarah Redwood: I think it depends on which calls they are applying to and whether they are eligible as a third country, in which case they would be covered by the underwrite extension. That is where we are looking to minimise the bureaucratic burdens in whether they need to reapply. If



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they are not eligible as a third country and it is an ERC grant, that would be subject to the funding decisions that the Minister has referred to.

Q144 **Martin Whitfield:** That is funding that we will have by that date as well. Minister, in your speech you quoted G K Chesterton. I am always reminded of his remark that the way to love anything is to realise that you may lose it. With our associate membership, do we now love Horizon 2020 more because there is a real risk we will lose it? We are not really sure how we are going to get back in, or is it your desire and undertaking—I phrase it carefully—to make sure we do get back in as an associate member so that the scientific community does not lose out on that collegiality, access and ability to achieve, not just for us in the UK but scientific knowledge?

Chris Skidmore: That is one of the more poetic questions I have been asked by a Select Committee.

Q145 **Martin Whitfield:** I take Chesterton; you might as well.

Chris Skidmore: The importance here is knowing the final framework for Horizon Europe. Obviously, there is still disagreement at EU level over what its shape will be. This is a much larger and more ambitious project than Horizon 2020. As the Member for East Surrey mentioned, we also need to look, in the context of the spending review, at the value of that association and its value for money, but my ambition is that Horizon Europe association should be our first priority; it provides something that is greater than the sum of its parts.

We are keen to take forward with the scientific community alternatives to international research funds, but we recognise the challenge of the work involved in establishing this. It takes time to earn that prestige, in the same way that the ERC grant process already has.

The answer is that when it comes to Horizon Europe I am keen to be able to go into a negotiation process where I can optimistically turn to my European partners and say that we are, as we have been with Horizon 2020, a significant net beneficiary of some of those scientific projects. When you look at the European investment research road map published recently, I think we were involved in 75% of those projects.

Q146 **Martin Whitfield:** In essence, less membership is better than no membership, but, no membership, not at any cost. Is that fair?

Chris Skidmore: When you look at the element of cost, it is about making sure that we get the best deal for Britain when fighting for our scientific researchers. If we are unable to reach an agreement on association, we will ensure that we have alternatives in place to make sure that Britain continues to be world leading. It is important in the overall envelope of funding to recognise and begin as a nation to look at how we establish ourselves with a greater international presence.



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We are looking to publish the international research and innovation strategy this year. Last week we announced £279 million-worth of funding for the global challenges research hubs. We are keen to make sure that we recognise the long-standing commitments to our European research partners, but at the same time other countries such as Israel and Canada are being involved in associations and European programmes. ITER points to a direction of travel that highlights greater international involvement. As the projects become bigger and the infrastructure becomes more expensive, the scientific community's arms are reaching wider around the world.

Q147 **Stephen Metcalfe:** Can I move us away from Brexit?

Chris Skidmore: Excellent.

Q148 **Stephen Metcalfe:** Was that a mutual sigh of relief that I heard? I think I might pop that bubble. I have sat on this Committee now for eight and a half—nearly nine—years. Every year we have the discussion about diversity in STEM. Depending on where you take your numbers from—what figures you look at—it is obvious that there is not equal representation regarding gender, ethnicity and background. What can we do about it?

Chris Skidmore: I am hoping that the establishment of UKRI, bringing together some of our research councils, is going to help to give greater ability to co-ordinate activity, particularly around the point of equality and diversion inclusion challenges—on who is receiving research funds. There would be greater ability to monitor and strategically understand where we are lacking in the UK in ensuring we have significant BME and female participation in science.

Q149 **Chair:** Do you think there should be much greater transparency of data on what is happening with who is applying?

Chris Skidmore: Yes. I am always a strong advocate, when we look at the uses of data, of the view that the most effective policy interventions come from, on the one hand, ensuring that we have effective data collection, and, on the other, moving on to effective data display. Finally, there is using that data display to be able to generate significant policy interventions. Whether we are still in the first stage or into the second, there is still more that could be done to highlight this.

It is not just in science. As a historian, I am particularly struck by the fact that in the UK there are only three black history professors, compared with thousands in the US, so it is not just in STEM that we face a problem; it is across our entire research communities.

We need to ensure that we can develop an effective pipeline. The issues we face are similar to those with the judiciary. Those who took forward their careers back in the 1980s and 1990s are now coming to the summit of their profession and are simply not reflective of modern Britain. UKRI has begun to have a co-ordinating role in not only highlighting



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inequalities and discrepancies but in taking strategic decisions. They have appointed Professor Jennifer Rubin, executive chair of the Economic and Social Research Council, as the UKRI champion for equality, diversity and inclusion. They have established an external advisory group comprised of individuals who have an expertise in looking at equality, diversity and inclusion. They have begun to build this evidence base around the data, which is commissioning three separate evidence reviews. Going forward, this will help UKRI to have a better understanding of some of the symptomatic and underlying causes.

UKRI, I understand, have begun development on the strategic framework, which will ensure that they take initiatives across all the component parts, and research councils of UKRI will be also be framed around impact. You mention being on the Committee for nine years. You can have a churn of initiatives, but where are the outcomes, where is the impact and how do you monitor that impact? It is almost like a scientific mission: you have to be able to understand whether it is going to be a success and have monitoring processes to evaluate and criticise a process if it fails to deliver.

Drawing on a more diverse talent pipeline, UKRI has launched its future leaders fellowships, a scheme designed to support early career research and innovators. The scheme is receiving about £900 million in the next 11 years, with 550 fellowships being awarded in the next three years. It has been deliberately designed to welcome applicants from diverse career paths, including those with flexible working patterns, which we hope will encourage more women to be recognised in their scientific communities, ensuring that they can have a family and that we look at BME diversity and geographic diversity. That is very important.

The strength in places fund is part of the industrial strategy. There is always a challenge around the so-called golden triangle of research. We have rightly prioritised over the last decade or so the importance of rewarding excellence, but that has led to a process by which a majority of grants have gone to the London, Oxford and Cambridge triangle. We need to ensure that, while we continue to fund excellence, we establish geographical locations across the country or we help to grow that potential, because, at the moment, parts of the country do not reap the benefits of science and technology and do not see the impact in their local communities.

More work can be done on university involvement. Bob Kerslake is running a report looking at civic universities. With the development of the knowledge exchange framework—the KEF—I am very keen that we highlight where universities can be catalysts and hubs in demonstrating research activity within deprived communities.

Q150 **Stephen Metcalfe:** I think we all recognise and accept that there is a problem. You have given a very comprehensive answer, which is great. I accept that you take the issue seriously, but I think that every



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predecessor of yours has done so as well. I hear what you say about UKRI. Do we need to take more rigorous action and start using much more of a stick to address this? If you have a leaky pipeline, as we said, there is no point in pouring more into the pipeline—it just leaks out in some way. We have to fix the plumbing.

We conducted our My Science Inquiry yesterday, in which we heard pitches from people about what the Committee should investigate. It was suggested that we address this diversity issue specifically through using funding. The figures presented to us showed that there was a significant issue with more funding going to more men, more white men, and it ran on and on. There is a bias in the system; it may well be unconscious—not deliberate—but it still exists, and we must do something to address that.

My final point is that we need more action rather than perhaps warm words. Another point is: does the fact that the BEIS budget for diversity has more than halved over the last nine years send out the right message, and should that not go back up in the forthcoming spending review?

Chris Skidmore: When it comes to looking at the plumbing element and what tools might be used in replumbing the system, there is a case for looking at funding allocation resource. The Office for Students, as a regulator, is able to look at continuing participation rates and BME participation across universities. We know when it comes to university drop-out rates—not staying the course—BME students are more adversely affected, so it is important that we take forward that work at undergraduate level. The natural codicil is what follows at a postgraduate researcher level.

The question around policy intervention would be: would you prevent a funding application if the research community that was attached to it was not representative? Personally, I would have reservations about preventing future research from establishing itself, because that would not benefit anybody. There would be an opportunity to grow a BME population within a certain research framework or a certain institution. The question would be: what nuanced policy interventions could be made around UKRI looking at funding allocation, with conditions being placed in the grant that allow the institution or the research programme to generate increased diversity, activity—BME activity—geographical indicator locality and the civic university activity I talked about? That would be quite interesting to explore.

I think you are beginning to see the dots join up around the academic research communities on issues such as universities' responsibilities to their local communities in their access and participation plans. We have seen an increase in the money that is being spent on these, but do we see the impact? There has been a flatlining over the last couple of years in seeing real change, so I am interested in taking both the BEIS side and the DFE's side of my portfolio.



The frustration as a Minister in two Departments, as I am sure the Member for East Surrey knows, is trying to establish a better joined-up approach, which is critical. We have STEM initiatives in schools to look at how we can begin that inspiration early, with programmes such as British Science Week coming up in March.

With the BEIS funding—I am sure my officials will correct me if I am wrong as I am sure decisions were taken before I became a Minister—we cannot have this being something that the Department does to the scientific community. If funding is going to be allocated, it should be allocated at a scientific-community level to ensure that it takes the decisions and owns those decisions, rather than expecting it to be a departmental strategy that is somehow seen as being a run from the centre. Jenny, do you have any further thoughts on that?

Jenny Dibden: I have a couple of thoughts. Chair, you are absolutely right in terms of data. You will have heard from UKRI a number of times not just about the fact that they are prioritising improving data in the area of EDI, but that generally it is one of their clear priorities.

Q151 **Chair:** That is, to be completely transparent.

Jenny Dibden: Yes. We can already see that UKRI has the ability to begin to marshal that data.

I would recognise, not disrespecting what you have said, that the original research councils, Innovate UK and HEFCE—as was—did have initiatives in this space. We have not necessarily seen the transformation that we might, but we need to recognise that some of those initiatives were quite good.

It is absolutely right that we are evidence-led; otherwise you risk going in the wrong direction. I understand what you are asking around hard levers. There is a significant amount of best practice that you can work on, not just UKRI but funded across the piece.

The hard levers will come out of the evidence and the discussions with the advisory group. The UKRI board is very interested in making a difference here, but hard levers may be around things such as conditions of funding, such as saying to universities that the policies they have for their staff and students need to be right before we can fund them, which is different from saying we are not going to fund a particular research group. It is about the institution.

Q152 **Stephen Metcalfe:** Do not get me wrong—I have seen a lot of good initiatives and know there is a lot of good work and good will—but I think we all accept that it has not been as successful as we would like.

Jenny Dibden: Yes, I agree.

Q153 **Stephen Metcalfe:** It is really a question of what more we can do, so please do not take it as a criticism.



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I listened carefully to what the Minister said about wanting this to be led from the community rather than the Department, but the amount BEIS puts into diversity has more than halved from £6.8 million to £2.5 million. It is not a huge amount of money in the overall scheme of things, but it is the signal it sends about whether this is an important issue.

Jenny Dibden: I am not entirely sure which budget you are referring to.

Q154 **Stephen Metcalfe:** Let me have a look. It was a report and subsequent work undertaken by CaSE that BEIS funding, distributed by the national academies for STEM diversity, has more than halved.

Jenny Dibden: Shall we write to you on that point?

Q155 **Stephen Metcalfe:** Yes.

Jenny Dibden: I do have details of the academies' core budget, but I think it will take a while—

Chris Skidmore: You have things you have to weigh up with that. In 2018 the ESPRC launched "Inclusion Matters," a £5.5 million project that invested in 11 "inclusion matters" projects, accelerating culture change with respect to diversity and inclusion within engineering and physical science. There are several pots of funding, and I want to make sure that that overarching envelope is reflected in the discussion as well.

Q156 **Stephen Metcalfe:** Perhaps we can have some clarity on that.

Jenny Dibden: Yes. We just need to look at the breakdown of the core academies' budgets.

Stephen Metcalfe: As I said, it was more about the signal it sends if the budget has fallen.

Q157 **Mr Gyimah:** Following Stephen's questions—he has been on the Committee longer than I have and has been around this carousel a few times—may I suggest that UKRI itself demonstrates it is taking a lead in this area? It is well and good for them to have a diversity board, but I think it would be good to see what UKRI's own plan is. It has about £6 billion of funding, it is a huge organisation and I want to see it taking the lead. That could move things in the right direction.

Chair: Absolutely.

Jenny Dibden: In terms of its own staff as well as a funder?

Mr Gyimah: Yes, exactly.

Jenny Dibden: It is currently operating largely on the policies of the research councils, Innovate and what was HEFCE.

Q158 **Chair:** Will it be publishing a plan for its own ambition on diversity?



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Jenny Dibden: Yes. Mark Walport has already given speeches on this, as the Minister said. UKRI is a transparent organisation, so it will be developing terms, conditions and policies.

Q159 **Chair:** Is there going to be a written plan that they can then be held to account for delivering?

Jenny Dibden: Yes.

Q160 **Chair:** Is that the plan?

Jenny Dibden: I do not know whether that is the plan, but I find it hard to see a plan that is not written down—not transparent in this particular area.

Q161 **Chair:** It would be good if you explored that further with them.

Jenny Dibden: Yes, I will.

Q162 **Chair:** May I ask a specific point about something that may well impact on diversity? Chris, you mentioned initiatives in schools. I came across fascinating research on the impact of triple science at GCSE. The argument put by the researcher who had completed the work was that, with decisions being made at 13 on who takes triple science, unless you are doing triple science you are often excluded from a career in STEM. Some schools do not even offer it, but many schools exclude lots of students from doing it and that has a disproportionate impact on children from lower socioeconomic groups. You are baking into the system a disadvantage in terms of the opportunity for careers in STEM. Unless that is addressed, we are guaranteeing that that disadvantage continues, are we not?

Chris Skidmore: Yes. I previously have been quite vexed about this. I remember a constituency case of a girl who wanted to study sciences at university. She had already mapped out her career route. She was at a local authority school that has now become an academy, but when it was a local authority school it did not offer triple science. I wrote to the headteacher. I managed to ensure that she was able to take triple science eventually by going to another campus, but I think—

Q163 **Chair:** She had the audacity to contact her MP. Most people do not.

Chris Skidmore: No, and I have previously argued that individual pupils who reach certain levels at key stage 3 should have a right to triple science. I know that was explored under the previous Labour Government as well, and I still personally think that there should be a national entitlement for some pupils who have clearly reached the levels that we know mean they can attain the triple science GCSE to be able to do so.

The key thing is data. If there are areas of the country that are ensuring that pupils are effectively being excluded from the triple science offer, that is unacceptable.

Q164 **Chair:** I would encourage you to pursue that with your DFE colleagues



and, if possible, report back to us on the response that you get from them.

Chris Skidmore: I will certainly do that.

Chair: Thank you.

Q165 **Bill Grant:** May I, first, thank the Minister for recognising Strathclyde University in his Culham speech in relation to the project into osteoporosis?

Chris Skidmore: It is fascinating, yes.

Bill Grant: It amazes me to be linking space technology to improving the health of the nation. That is wonderful, so thank you.

Chris Skidmore: The nanokicking technology in Strathclyde is a classic example of not only the interdisciplinarity of looking at the work, but of making the case on 2.4% as well. It is showing that the return of investment you get is not just in the sector but in other sectors as well, highlighting, when it comes to the augmented reality technology that is now happening, knee surgery at Imperial College.

We have to capture the value of this research beyond the immediate purposes to which it is put. Nanokicking is a classic example of where we have to come up with a new narrative around R&D. Demonstrating the value that this brings is not just a financial one in terms of increased private investment, but a social one in what it might mean for the future health of the nation.

Q166 **Bill Grant:** It is also outside that triangle we often talk about: it is way up north, and there is some really good work there.

The second phase of quantum technologies could be game changing and life changing if it evolves in the way in which it is anticipated. In the 2018 Budget, I think that £235 million is allocated for the second phase of quantum technologies. What progress has been made in the implementation of the second phase? When can we look at the formation of an executive board and a roll-out of, I think, four innovation centres? Where are we in that journey to the second phase of quantum technologies?

Chris Skidmore: We had £235 million announced in the autumn Budget for the second phase of the national quantum technologies programme, which is for 2019-2024, but that was on top of an additional £80 million announced in October 2018 for the continued funding of the hubs in phase 1, so there is a sort of overall envelope of about £315 million. A key centrepiece of that is the £75 million funding for the National Quantum Computing Centre.

I have a breakdown of some of the other phase 2 activities, but the majority of the funding that was announced in the Budget is still subject to business-case approval. As far as I understand it, UKRI is now in the



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process of developing them for the relevant activities, which, in addition, include the continuation of the hubs, which includes £15 million of capital on the hubs and on training, fellowships and research. Last week at Davos the Chancellor announced the AI fellowship programme, and there will be a doctoral announcement coming with that, but, in terms of UKRI and the Budget's business-case approval of the separate component projects, I think UKRI held a workshop with industry partners in December to help define the scope of the National Quantum Computing Centre. I might turn to Jenny to give more and clearer updates.

Q167 Bill Grant: May I clarify the question? Do we need the formation of this executive board before we see the dissipation of the allocated funding, which is quite significant and very welcome, but I do not think it is welcome if the Chancellor has it tucked away in a drawer somewhere? We have to get that investment out into the areas where we can reap its benefits, and some time has elapsed since that announcement.

Chair: When will we get that executive board in place? Is there a deadline by which it will be appointed?

Chris Skidmore: I have to turn to Jenny on this one, I am sorry.

Jenny Dibden: Yes. We are due to write to you shortly, are we not, in response to your quantum technologies inquiry? The governance around phase 2 of quantum is in development. It will become clear and then we will be able to give details of that.

Q168 Chair: There is still quite a lot of uncertainty about the timescale for when we will get a board in place.

Jenny Dibden: We need to write to you with details. There is a lot of activity going on at the moment. We have had announcements around the money, and there is lots of work going on, as the Minister said, around business cases and lots of discussions about the appropriate governance for what is a substantial amount of money and getting the best value out of it, but we will be able to write to you about that.

Chris Skidmore: It is also important to say that you have Government-funded, Government-led initiatives, but we should not forget the importance of the bottom-up approaches that are being taken by the sector. I was in Cardiff two weeks ago and went to see the new establishment of the Compound Semiconductor Applications hub. That has been just universities just getting on with it, really.

In Glasgow there is the Fraunhofer Centre for Applied Photonics. This will come down into the infrastructure roadmap that I think UKRI are looking at, which is to say: when we look at future funding decisions, when we look at future potential for infrastructure and quantum, we need to look at where the gaps in the current landscape are as well. We do not want to replicate things across the country.



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Jenny Dibden: We are due to come back to you. We have an agreed date for coming back to you on your recommendations, which did include the establishment of the executive board. We are due to come back on 18 February.

Chair: Great. We will no doubt learn an awful lot more then.

Q169 **Bill Grant:** I fear, if we do not make progress on this, that there are other nations pursuing the values and benefits of quantum technologies, and I do not think you can let it slip back in the timescales.

Another Minister-led review on quantum technology was anticipated at the end of 2018. We have now run into 2019. I know there is a lot going on in Parliament with different things, but it was anticipated at the end of 2018. Do we have any indication as to when it may be published, to give us a steer of what recommendations may evolve? I know it would be remiss to ask what all the recommendations are, but in what direction would it be going as and when it is published?

Chris Skidmore: The advice I have been given is that the review is due to report to Ministers early in 2019. The findings will be shared with the wider community and we would welcome an opportunity to update the Committee on the findings in due course. I would say, though, that many of the Committee's findings chime with the reviews and we are now working through how to take them forward. It is coming shortly, I believe, but I cannot give any more.

Q170 **Bill Grant:** May I push slightly, because we anticipated it at the end of 2018. It is coming soon—it is like a cinema advert: "coming soon"—but when is soon?

Chris Skidmore: I guess the cinema analogy means you have—

Bill Grant: "Coming to a Parliament near you soon."

Chris Skidmore: —a change in the character, in terms of ministerial actors who are on the stage, and the Department needs to allow for processes to adapt to that change.

Jenny Dibden: But, at a minimum, when we respond by 18 February, we will be able to tell you where we are in that process.

Q171 **Chair:** Will we have clarity in the response on what the plan is for innovation centres?

Jenny Dibden: I think that will be covered. It will be a full response to your inquiry.

Chair: Good, thank you.

Q172 **Martin Whitfield:** I am going to advertise an ongoing inquiry into clean-growth emissions—we took our first evidence session a couple of weeks ago—which of course leads to the clean-growth strategy and the £2.5



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billion that has been announced for the innovation. Minister, what is your role in that £2.5 billion—overseeing it?

Chris Skidmore: I am working with my colleague Minister Perry as a single ministerial team to deliver the clean-growth industrial strategies. This is co-ordinated through the Energy Innovation Board and significant increased funds have come up through the industrial strategy challenge fund—£455 million—to support clean-growth areas, including some £70 million in the industrial decarbonisation challenge.

In looking at my part of the portfolio, when it comes to clean growth, out of that £2.5 billion figure that you mention we have the £505 million energy innovation portfolio. In terms of investment, I have a breakdown of where that is looking to invest: £70 million of smart systems; £90 million in the built environment; £100 million in industrial decarbonisation carbon capture; £180 million in nuclear innovation; £50 million in renewables innovation; and £50 million in support for entrepreneurs and green financing. I will be engaging closely with the direction of this portfolio. I am keen also that it is co-ordinated and strategic in its approach—that it is not lots of different things going on but is joined up.

We then have to look at the framework of the carbon budgets to make sure that we keep on track towards the legally binding 2050 target of reducing greenhouse gas emissions by 80% relative to 1990 levels. I think we are ahead of target, as we see in our first carbon budget, 1.2%, and on track to meet the second and the third, which is 2013-2022.

We need to look now at whether to carry forward our overachievement from carbon budget 2 to carbon budget 3. We are waiting to receive some advice on that, but I am keen that we can look at what the opportunities are for innovation for clean growth, not just in the next five years but in the next 50 years; it is really important.

Going to Culham one can see JET and the potential new technologies that are offered, and obviously we have ITER down in Marseilles, but the sort of potential for step projects, looking at the longer term into what might be able to happen with nuclear fusion as a clean technology is also highly exciting. I am keen not only to look at the short term but at the longer term.

Q173 **Martin Whitfield:** One element of your remit through the energy innovation programme clearly sits in the commercialisation of these technologies. It was interesting when we took evidence from Guy Newey, the director of strategy and performance—he very much welcomed the work—that he warned the Committee that, if we do not get the market structures right for the commercialisation, there is a real risk that we are just going to support isolated projects that effectively go nowhere. Clearly, you are aware of that risk, but have you given any thought yet to the joined-up thinking that needs to take the commercialisation into the market structures?



Chris Skidmore: I am sorry to sound like a broken record, but I go back to the 2.4% here and making the case that the commercialisation of clean-growth technology is highly important when we are building that increased investment to the portfolio for R&D to be able to demonstrate that these are not white-elephant projects but projects that have significant profit margins for the future and potential for developing entirely new industries, ensuring an entirely new sector in which there will be greater employment opportunities, and highlighting that. So, yes, the commercialisation strategies that need to—

Chair: But designing the incentives and so forth that create the market for a new technology, we were told, was very important, to make sure that it happens.

Q174 **Martin Whitfield:** I was going to say, if you line that R&D up with the market mechanism, that is where you get the reduction in cost and the technology that then accelerates the roll-out, accelerates the acceptance of it and suddenly embeds it. Certainly, there is a suggestion that we have not been particularly good at that, but this is an opportunity. What I am asking is—clearly, you are aware of it—what steps are being taken to ensure that alignment with market mechanism and that the facilities are there within the levers that the Government have to make that work?

Chris Skidmore: I might have to turn to Jenny on this point because she can provide further detail on the maths precisely, but the general principles I entirely accept.

Jenny Dibden: If I take the industrial strategy challenge fund as an example, we have talked about the amount of spend that is going to go into the clean-growth area—the foundation industries, the decarbonising clusters and electric revolution. There are a couple of quite significant things about that. Those challenges have been developed absolutely with business and are industry-led, as problems that need solving that can, ultimately, translate into something that can be transformational. That means looking at market mechanisms, costs, and so on—so, absolutely. Not only is industry involved in developing those challenges, but it is also putting in near-matched funding as well, so there is significant leverage. We have learned a lot about how to do this over the waves of the industrial strategy challenge fund, and I think there is a real opportunity here to do that.

Q175 **Martin Whitfield:** You are confident, learning from the past—I think particularly of the cost reduction—that access into the marketing will work. You are confident that that is going to happen within the clean-growth strategy, and in particular the energy innovation element of it.

Jenny Dibden: I would need to take away that specific and talk to my colleagues.

Chair: You can come back to us with that.

Martin Whitfield: That would be useful.



Chris Skidmore: I am also responsible, as a Minister, for taking forward the grand challenges of the industrial strategy and the grand challenges delivery board, which is co-chaired by Sir Patrick Vallance, the chief scientist. Within the grand challenges and the four areas, we have clean growth, but two of the five missions that have been announced are in clean growth. Clean-growth mission 1 is to halve the energy used in new buildings by 2030, and clean-growth mission 2 is to establish the world's first net zero carbon industrial cluster by 2040 and at least one low-carbon cluster by 2030.

I mention this because, when looking at the missions and the process of the delivery board that I will co-chair, we were very keen that when we look at the purpose of a concept, of a mission, we do so in a way that has clear, identifiable outcomes and deliverables. Pointing to the scope of that mission clearly reflects the points you are making about ensuring that the incentives around commercialisation are there. That will be a key part of whether there is to be success in the mission. We are working now on looking at how we can adopt effective evaluation mechanisms that will recognise those outcomes. The points you make here I will take back also on the missions, but the concept of the mission is to make sure that there is not mission failure here.

Chair: Fantastic. We are now going to have a number of quick-fire questions. Hopefully, the questions will be quick, and the answers will be brief as well, and that will enable us all to finish reasonably on time.

Q176 **Stephen Metcalfe:** It is a quick question, but it is a big ask: when the industrial strategy White Paper was published, it said it wanted to address the productivity gap. When is it going to deliver on that?

Chris Skidmore: I think you have seen significant investment going through the national productivity investment fund. Something like £45 billion has now been earmarked through that over the longer term. My quick answer would be the work that is now ongoing through the establishment of the National Industrial Strategy Council, led by Andy Haldane, will be quite key to evaluating the progress and success of the industrial strategy. I know they had their first board meeting in November, but they are looking now—I met Andy Haldane last week or the week before—at establishing a research function, which is going to look at the success of the sector deals as its first sustained wave of research. I think the council will begin to deliver on demonstrating what has happened in terms of productivity. Andy Haldane is the man himself when it comes to evaluating productivity in the economy.

Q177 **Mr Gyimah:** What would no deal mean for businesses and researchers that hold Copernicus contracts post March 2019?

Chris Skidmore: I am again going to mention ensuring that I can do the maximum possible for the science and research communities. I guess the space community, as you are well aware, post Galileo, has significant



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concerns over our ability to participate effectively in projects that we co-funded and established.

We are keen that we go forward with future investment—a possible replacement for Galileo. As you know, we have made the money available there, but we are still keen, as part of the Government's White Paper, to say that we want to continue participating in Copernicus.

To make the most of our future participation, we are looking at the nature of its earth observation data and the services that are currently being used across the UK. I attended POST's annual reception yesterday. The British Antarctic Survey were there, and they were clearly making the point to me that it would be the Copernicus network that would be taking forward the next stages of some of these Antarctic observations.

Q178 **Mr Gyimah:** Including to March 2019, what happens to contracts?

Chris Skidmore: Moving forwards, with some of the contractual obligations, we have put some sorts of assurances in place, but I am going to turn to Sarah to go over the details on that.

Sarah Redwood: To be honest, in the event of a no deal, the UK-based entities would not be able to bid for future contracts tendered through the EU or any other process related to that. In the event of a no deal, though, we are preparing our contingency plans to enable us to carry on having access to the earth observation data that the UK users rely on. That is all work that is in progress.

Q179 **Mr Gyimah:** Where there are contracts with delivery dates post 2019, what happens to them?

Sarah Redwood: I would need to follow up with you on that one.

Chair: Do that.

Chris Skidmore: The problem is the Catch-22 of being able to open up negotiations with the Commission, and we are unable to do so at the moment. I have tried to talk to Jan Wörner on the phone; I had an early bilateral with him. I am meeting him next week, I think, to continue our discussions and to try to work with ESA around who are our partners who can make the case for continued co-operation for the UK.

Q180 **Chair:** Yes. Are there some bodies in the UK currently involved with Copernicus who would be anticipating bidding on some round of contracts in the near future that they would be excluded from? Is that a concern that has been raised with you?

Chris Skidmore: Not with me personally one to one. I have also been working with the space sector on looking at wider ambitions for the national space programme and what sort of future infrastructure investments might be needed in the event of a no deal, what alternatives might be needed for Copernicus, what potential there would be for observational satellites and apparatus to replace that around the



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Antarctic, for instance. Those are key issues, a bit like the international research funds, where we are looking at the potential alternatives.

- Q181 **Martin Whitfield:** Mine is a slightly bizarre question about UKRI research internships. Would you investigate the real-terms stipend payments that interns who study at the research councils during the summer placement receive? UKRI policy mandates that summer interns to the research council funded summer placements receive a bursary and stipend to a minimum level of £200 per week. That is actually the level they seem to receive; this lasts for eight to 10 weeks. Given the hours that they put in over the summer, which way exceed even the 35-hour week, the payment is well below the minimum wage and, in reality, for cities such as London, is so low that a significant number of interns are not able to take up the positions. I realise that you cannot answer immediately, but it would be very helpful if you could look into this.

Chris Skidmore: I will take it back, and it goes back into our point around increasing access.

Chair: Absolutely.

Chris Skidmore: I am happy to take that away.

- Q182 **Chair:** Perhaps I could also ask this. You may be aware that we have done reports on research integrity and on clinical trials transparency. Do you agree that clinical trials remains an issue that needs to be tackled, with the transparency of publishing all the results, particularly, I should say, in the university sector, where there are some universities that are very good at meeting the rules, but others are, frankly, woeful, and do not appear to have responded particularly to our reports about the importance of this? Will you commit to supporting efforts to get all clinical trial results published, as is required now but is routinely breached by many universities?

Chris Skidmore: I am aware, obviously, that the Committee published its report into research integrity, the issue of transparency and clinical trials last October. As I have mentioned, I am keen, when it comes to ensuring access to data, that the maximum possible is made available. I think UKRI is looking at commissioning research to evaluate the effects of incentives in the research system on research and behaviour to be able to support this issue of research integrity.

- Q183 **Chair:** It is really this narrow point. There should be 100% publication of clinical trials results. There is not at the moment. Pharmaceutical companies largely comply now. Some universities comply almost completely but there are many others that fail to, and a clear statement from the Minister that says full compliance is necessary and expected—and expected now—would be very helpful.

Jenny Dibden: UUK are updating their concordat to cover this point. Clinical trials are a DHSC lead, so it is important that we work closely



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with them. Obviously, we have the joint unit, the Office for Lifesciences, so I think we need to come back to you on that commitment.

Q184 Chair: I am not sure you need to come back to me on the clear principle about the importance of compliance with existing rules on clinical trials transparency. Can you say, Minister, here and now that you expect all universities, all research establishments, fully to meet the clinical trials transparency rules?

Chris Skidmore: I want to make the commitment that personally I would like to see as great transparency as is possible. Unlike you, I have not been a health Minister, so I am not aware of some of the potential implications of full transparency for the nature of the trials and the nature of the IP protections.

Q185 Chair: These are existing rules. There are existing requirements. Perhaps I have caught you on the hop. Perhaps you could write to us to confirm, hopefully, your clear commitment, which we have had from the chief scientific adviser to the Government and I think from predecessor Ministers in your role. It is important that you give that clear steer to universities that they must comply.

Chris Skidmore: I would be keen to ensure, as I have mentioned, the maximum possible transparency. We are in an age where I have other areas around looking at not just clinical trials but around open access and data publications. We are moving into a world where having that ability to underscore transparency with increased use of data to be able to make policy decisions is a welcome one.

There is one point I want to raise around the Committee's reports and potential recommendations for a national research integrity committee. I am especially keen that that work is taken forward.

Q186 Chair: Great. That was going to be my next question.

Chris Skidmore: Other departmental leads and departmental Ministers have responsibility on policy decisions, but, on the areas where I have policy decisions, looking at the possible establishment of a research integrity committee is something that I am especially keen to take forward—that recommendation of the Committee.

Q187 Chair: I think UKRI has now presented its proposals to you.

Chris Skidmore: Yes. I have had a conversation with Sir Mark Walport about this work, but obviously he has raised it in a speech. It was part of my Culham speech as well and I want to be able to come back, hopefully soon, with positive news for the Committee. I might be able to contact you, Chair, personally to let you know when we are in a position—

Q188 Chair: That would be very much appreciated. I think there is a great opportunity for the UK to lead on this. If you could also specifically come back to us on the clinical trials transparency point, I would be very grateful.



Chris Skidmore: Yes, certainly.

Q189 **Chair:** Finally, rather bizarrely, we ran a social media initiative that we called #AskSamGyimah. Various people came back to us with questions that they wanted us to put to the Science Minister. If I could, I will very quickly go through some of them.

From the Welding Institute, the question was: how will the Government ensure continued collaboration with overseas partners on research? You have covered this to a degree, but can you give a succinct answer that we can give to the Welding Institute?

Chris Skidmore: The key thing here is around the future publication of the international research and innovation strategy, being able to demonstrate that we are open to international researchers. We have already begun to upskill some of the fellowships, such as the national academy fellowships with an extra £350 million, and we are also investing more than £100 million in the Rutherford Fund, which is open to the world. Obviously, we have seen the Global Challenges Research Fund and the Newton Fund, so this is a key future direction.

The UK is at a crossroads as it leaves the European Union, but we want to be able to maximise our opportunities internationally as well, and programmes such as ITER, for instance, are key international programmes in which we want to be fully participating. There is a huge opportunity, I think, to be able to demonstrate international commitment.

Q190 **Chair:** Thank you. From Tony Lockyear: how will the UK maintain its status as an attractive location for science funding in collaboration after Brexit?

Chris Skidmore: This is about people, about ensuring that we provide the opportunities for career researchers, for post-docs, to be able to grow their talents. We talked about the immigration White Paper and some of the potentials there. Obviously, the creation of the tier 5 visa for excellent researchers is a demonstration that more can be done. We can look at ways in which we can try to attract excellence within the science community. Taking that message forward about drawing the best and the brightest into this country is something I am really keen to do.

Q191 **Chair:** Thank you. Finally, we heard that small businesses find it too challenging to access catapults. What are the Government doing to address this?

Chris Skidmore: We have made a significant investment in the catapult projects; it is about £1.8 billion, I think, or £1.2 billion, over the last five years. We are continuing to do so. I am going to the Digital Catapult in King's Cross later, where I am making a speech at the launch of their future lab. They have seen key small businesses, start-ups, benefit directly from that Digital Catapult.



We had the analysis or evaluation of catapults done by Ernst & Young in 2017, which demonstrates that they are working. They embed themselves in local communities, and they are now reaching out to SMEs. We have forecasts that we will be working on about 4,600 projects that are based around SMEs over the next five years. I have a catapult in my constituency, the National Composites Centre in the Bristol & Bath Science Park, and I have seen at first hand also the benefit of that ability to draw in talent. It is a valid point, but I am hoping that the work that the catapults have done over the years is now increasing their activity in SMEs.

Jenny Dibden: To be clear, I provide that opportunity to look again at whether there are any aspects of functioning that could be adjusted.

Q192 **Chair:** But do take on board the fact that the feedback we have had is that small businesses, from their perspective, find it difficult to access. It may not be a uniform experience, but take it on board and at least explore why that concern might exist. If you have anything you can report back to us on that, we would appreciate it.

Chris Skidmore: There is the challenge of scalability. One of my priorities is the applied nature of research, taking forward spin-offs. University sectors, such as Imperial, have their start-up hubs where they are allowing students to go off and form their own small companies and take the IP with them. Our big challenge is that we have a capital "R" and a small "d" sometimes when it comes to looking at the future of R&D and it is about how we can support and nurture those small companies to become leaders in their field.

Chair: Okay. Thank you all very much indeed. We appreciate your time and your willingness to respond fully to all our questions.