

Agenda: Science, Research and Innovation

10.00am-12.00pm

22th July 2021

[CLOSED Session, 10.00am-12.00pm \[120 MINS\] - Commissioners Only](#)

Chaired by Professor Shearer West and Dr Geoff Mackey

In attendance:

- **Members of the Commission:** Professor Alan Winters (Chair); Tamara Cincik (Chair); Sir Roger Gale MP; Liz Saville Roberts MP; Hilary Benn MP; Paul Blomfield MP; Paul Girvan MP; Dr Geoff Mackey; Dr Stephen Farry MP; Professor Shearer West; Dame Rosemary Squire; Peter Norris; Claire Hanna MP; Alison Williams; Caroline Lucas MP
- **Expert Advisor to the Commission:** David Henig.
- **Attendees from the Secretariat (Best for Britain):** Naomi Smith; Flo Hutchings; Julia Meadon; Paul Haydon; Laura Savage; Jake Verity; Lauren Tavriger.

Apologies: Andrew Ballheimer; Layla Moran MP; Aodhán Connolly; Dr Philippa Whitford MP

22 July 2021

Professor Shearer West

Welcome everyone to the evidence session today which is on science and R&D, and this is a particularly interesting moment to have this session, it's in two parts. The first part is on science and R&D and the second part on innovation and today the Government's innovation strategy has been published so it's quite timely to have this session now. We welcome three witnesses today and I'm going to ask each of you in turn to introduce yourself and then we will get straight into the questions. So can I start with you Jamie?

Jamie Arrowsmith

Thank you, yes, I'm Jamie Arrowsmith, I'm Assistant Director for Policy and Regional Engagement at Universities UK International, so we are the representative body of higher education institutions.

Professor Shearer West

Thank you. Chris.

Chris Pearce

Yes, good morning everybody, my name is Chris Pearce, I'm the Vice Principal for Research at the University of Glasgow where I have strategic responsibility for all aspects of research and its impact and more so a Professor in our James Watt School of Engineering where I

hold a Royal Academy of Engineering Research Chair. And just for some context the University of Glasgow is a broad-based research intensive university and we are members of the UK Russell Group of Research Intensive Universities and the Guild of European Research Intensive Universities.

Professor Shearer West

Thank you. Martin.

Martin Smith

Good morning, I'm Martin Smith, I'm a Policy Manager at The Wellcome Trust. The Wellcome Trust is a global charitable foundation focused on improving health and we tackle the World's greatest health challenges by funding an awful lot of research. We spend around a billion pounds a year and the vast majority of that is spent in the UK because the UK is a very strong place to do science.

Professor Shearer West

Thank you very much everyone. We've got quite a lot we want to get through in this hour and people tend to get quite enthused and excited while they're answering questions and asking questions so I will try to keep us to time, we have about seven minutes for each Commissioner to ask questions and they will direct them to very specific individuals. So, I'm going to start with a very open question really, we all know that the Prime Minister has talked about the UK being a science super power and I wonder for each of you what this actually means and how close we are to that and also are we heading in the right direction. So can I just start with Jamie please?

Jamie Arrowsmith

Thank you. I think the scientific super power could mean many different things to many different people. I think from my side I would say the aim is to be recognised for producing work of international significance that delivers impact at a variety of levels, so locally, nationally and globally. I think in science and research you get that status and that reputation by delivering excellent science and having an environment that promotes and facilitates really high quality work. I think in the UK we do already have that, our universities are at the heart of the publicly funded science and research UK system and I think that while public and private investment probably lags somewhat behind to our competitors in terms of R&D, I think if you look at the outputs then we really do have a kind of world class system. I think that's demonstrated in global rankings which really show the high esteem in which UK research, UK universities is held. And if you look at the comparison between inputs and outputs within the system as well with I think it's 2.7% of global R&D funding the UK produces around about 15-16% of the World's most highly cited research output, so I think that suggests that we have an excellent system that's highly geared as well. I think there have been concerns about the UK's success in securing funding towards the end of Horizon 2020 where we did see a drop off and I think we'll probably come onto that a little bit later. But I think it is still worth noting that the UK coordinated more projects than any other programme country through Horizon 2020 and I think that whilst globally that competition is increasing, we certainly can't be complacent, we know there is huge growth of research

inputs, research outputs and performance in Asia and predominantly in China and there's also huge stimulus investments planned in the US for example but our performances I think remain sort of really first class and does give us that kind of excellent foundation for moving forward.

Professor Shearer West

Thank you, do you think we're moving in the right direction? Or have we been standing still?

Jamie Arrowsmith

I think there are different parts to that, I think as we said, I think the UK's share of those sort of global outputs has sort of fallen back a little bit in the last couple of years, that's partly because the global system is static as well, other systems and particularly competitors are maybe investing more than the UK so as I say I think we've got that excellent base, I think we need to ensure that we don't let that kind of fall any further back.

Professor Shearer West

Thanks Jamie. Chris.

Chris Pearce

Yeah I mean I would endorse much of what Jamie has already said and so in many ways I would argue that we're already a science super power, we are genuinely world class in many areas of science and UK research, UK science is unquestionably one of the UK's greatest assets. Perhaps one other interesting statistic in context to this today is that not only have we got a very high share of the most highly cited outputs but we're also one of the most collaborative scientific nations in the World with something like 55% of our publications with international co-authors. And this is really important when so many of the big challenges we face in society are global ones and of course the pandemic has shown the value of investing in the UK's long-term fundamental scientific research where our universities, our research organisations have been at the forefront of the fight against coronavirus. I think the pandemic has also shown the value and importance of the fantastic independent scientific expert advice that we have available to us in the UK. So for me the question is not how do we become a science super power but may be come Professor West to your question, you know are we standing still, I think the ... sorry my doorbell has just gone ... so for me the question is how do we maintain it and more importantly continue to strengthen it. There is fierce international competition with countries that have significantly longer-term investment plans and R&D policies. Research is a long-term endeavour, many of the scientific breakthroughs that we see, observe and are working on will take decades and have taken decades. So, we've got to translate the headline message and intent of being a science superpower into investment, into our research environment, into our people, into our research infrastructure. And I think it's fair to say there's not a lot of confidence at the moment in that ambition. I think the recent announcements of the new National Science and Technology Council and the Chief Scientific Advisor leading a new office for science and technology are positive developments, my hope is that this provides us with a long-term, clear and consistent direction of travel. And then maybe just finally say that as a Scot representing a Scottish university it's important for the Government to look beyond the

geography of the so-called golden triangle and ensure that attention and funding is distributed fairly across all four nations of the UK in order for us to be a science superpower.

Professor Shearer West

Thanks very much for that Chris and of course we just saw today that the UK RI budget hasn't been approved yet so we've got another bit of a blow to science budget at the moment. Martin.

Martin Smith

Thank you well I agree with a lot of what's already been said but I wanted to look a little bit wider as well, so yes, in many respects the UK is already a global leader in research, we've got very prestigious UK institutions, we've got researchers that are at the cutting edge of their fields. But for me I think it's a little bit more than that to really live up to the full super power metaphor and there's two reasons for that. One as Chris said, science these days is all about global collaboration so in 1981 about 5% of the UK's research publications were with an international co-author, the stat that Chris just gave is that it is more than 50%, 55% I think he said so that's a huge change in that time. So maybe in the 80s it would have been enough to just be the top of the league table in some sense but today research is all about teamwork and collaboration and what a super power does is recognise that trend and really make the most of it. The second angle is that if you're talking about a super power in the context of defence or security or foreign policy it does more than just look at its position in a league table and feel good about itself, it projects that influence around the World, it makes use of that power in all sorts of ways and I think that's actually one of the intentions of the integrated review and research was made at the first pillar of that strategy which is very encouraging and it talks about things like science diplomacy and leading the response to things like antimicrobial resistance, but to really make sure that we're living up to that super power idea we have to be more than be the best in a narrow sense. I see that recognised in the sort of things the Government is talking about but as the other speakers have said the proof of the pudding really comes down to whether or not that will be translated into action, particularly at the spending review that's coming up soon.

Professor Shearer West

Thank you everyone, and that was very concise and really quite full answers. Can I move onto Professor Alan Winters who is going to take us through the next question?

Professor Alan Winters

Thank you Shearer and thank you gentleman witnesses. I've got a broad-ish question I guess, at least in our minds there's some confusion about what funding plans are so far as science is concerned and I wondered if you can shed any light on that, and I know this is a moving target, I've seen the Financial Times this morning, but to the extent that you could I think we'd find it very useful because science certainly requires resources. Why don't we start with Chris this time?

Chris Pearce

Yeah thanks. Well on the face of it, we have from the Government the dual commitment of growing public R&D spending to £22 billion by 24/25 it is currently if I'm generous about £14.9 billion, so that's a big change. And the other commitment is reaching a total R&D investment of 2.4% GDP by 2027, it's currently I think about 1.7% and even 2.4% is not actually what I would call ambitious, it's getting us up to the OECD average. So this is good news and it's been enthusiastically welcomed I would argue by the sector, it's very ambitious, but it's also old news. A commitment that has been reiterated several times over a few years now and I think there is waning confidence in it and maybe I'll just explain a few of the concerns around that. Given the investment needed to reach either these pretty ambitious targets we have just seen an 8% cut in this year's UKRI budget and as we've just heard a delay in next year's budget. UKRI provides the core funding for discovery led research by which we address the biggest gaps in our knowledge and it provides the essential foundations on which we tackle society's big global challenges. And this cut of 8% has included a 70% cut to live overseas development assisted related research projects that's had huge impact on careers and global collaborations. Second thing I was going to say was that the recent UKRI settlement was only for one year, so this does not send a strong message or build confidence. There's also uncertainty of where future funding for participation in Horizon Europe is going to come from and there's real concern that it's going to have to be absorbed into an already stretched science budget. How the planned R&D funding is going to be distributed in the future, how it's going to flow is also a question and what we really need is a detailed long-term R&D strategy that goes beyond what we have at the moment, which essentially is a road map. And then my last point is that a significant proportion of our critical biomedical research is funded by medical research charities and this covers research into areas like cancer, cardiovascular disease, arthritis, diabetes, dementia and the pandemic has dealt a massive blow to many of these charities and shown that we need a much more sustainable source of funding for this critical biomedical research. So there is real waning confidence as to if and how we will see funding materialise. And the consequence of this is that funding bodies, universities, businesses cannot plan for the long-term and if we cannot plan for the long-term we will not be best placed to support the Government in addressing the big challenges, transitioning to a green economy, long-term public health, security and so on.

Professor Alan Winters

Thank you very much. Martin, Chris has mentioned charities but doubtless you've got some other things to say as well.

Martin Smith

Yes, indeed, so as Chris says there's those two targets, one is that 2.4% by 2027 which is obviously a relative target rather than an absolute figure and it means that the Government only has control over part of it, the public investment and it has to try its best to try and get private investment to hit that target. So the £22 billion that's been public investments by a much sooner date of 24/25 is a really important staging post on that journey to 2.4% and the idea is that if you invest up front from a public site then you're able to crowd in the private funding. So as Chris says if we don't get that £22 billion and it's not unreasonable for people to be slightly cynical about whether it will happen given the current economic climate, then confidence is going to evaporate which of course then starts to create problems with being able to lever in the private investment. So the Government really does need to deliver on this £22 billion target if it wants to get where it keeps saying it wants to go. Chris mentioned that 2.4% is the OECD average and indeed it was when the target was set a few years ago, of

course the thing is we are counted in that average and as we increase our spending even if nobody else did that average would increase, so we're actually now heading for something slightly less than the OECD average, I think it's now something like 2.5%. The other reason why cynicism may be justified is that this isn't the first time that we've had a target like this, actually in 2004 previous Governments made a commitment to reach 2.5% within the following ten years and that just didn't happen and part of that is recession, part of that is change of Government, it's very easy for targets to be lost and so we really do need to actually hit it this time to make it work. Chris also touched on paying for Horizon, there was a very strange wobble earlier this year when it looked as though the bill for Horizon was going to involve cutting money elsewhere which would have been utterly perverse given what the Government says it's trying to do with increasing funding. A settlement was cobbled together that means that Joint Horizon doesn't have a direct impact on UKRI spending for this year, but actually because of some detailed way that the billing is worked out, when it comes to next year the bill will be much bigger and so again the spending review desperately needs to get its house in order to make sure we're not going to end up with another problem there in future.

Professor Alan Winters

Thanks. Jamie.

Jamie Arrowsmith

No, thank you. I think Martin and Chris have really set out the key issues there I think very well. I think it is non-trivial that the base research project is up to, I think as Chris said around about £40-50 billion and the increases we've seen but the fact is that you know the UKRI budgets have been reduced now and that just suggests some kind of retrenchment and I think there is a mixture of ambition and ambiguity within the Government plans. I think the 2.4% target as sort of Martin and Chris both indicated, it does leave lots of uncertainty about what that means for the level of public investment and I think the research community, international partners what they really need to be seeing is certainty and stability to allow that growth and I think it was as Chris mentioned earlier, you know research is a long game and partnerships take time to develop, so you do need that basis. The cuts to in particular global challenges research funding due to the removal of the ODA [ph 0:17:40.2] target of spending 0.7% of GDP on development that created really significant challenges for universities and as Martin has just indicated at around the same time we also had this wobble or the confusion over the funding for the UK's participation in Horizon and I think that uncertainty would, well the actual impact of that, not just the uncertainty would have been really catastrophic and that was avoided but we can't be in that position again in the future. There's a spending review coming up, we know that the funding environment is going to be extremely challenging, I think the IFS report out this week has made that very clear. But I think investment in R&D has to be seen as just that, it's an investment in the future prosperity of the UK, it drives productivity and growth and I think research and innovation and the international elements of that as well, they will support growth and they'll also help Government to meet a whole wider set of objectives as well that they've set out in things like the integrated review. And so I think that through that spending review we need it to do a number of things, I think the first as Martin is indicating, it's about setting out a credible plan for meeting at the last that 2.4% target, but I think we need to focus on raising the cash investment to £22 billion, that's the aspect I think we need to focus on in the short-term. There needs to be funding and resources to meet all the existing commitments that Government has made, whether that is through GCRF and other ODA funds and indeed

Horizon as well, we can't be in a situation where there's uncertainty around that in the future. And I think the third point is a critical one and that's ensuring that universities, that they have the flexible resources to invest in strategic relationships and researching partnerships and I think that's got to be through ensuring that there is a sufficient quality related research funding as well through the dual support system, so I think they'd be three of our priorities for that spending review to provide a bit of clarity and certainty.

Professor Alan Winters

Well thank you very much, that's all very useful if a bit depressing, so let me hand back to Shearer.

Professor Shearer West

Thank you very much Alan, and I'm now going to Hilary Benn MP who will, we've been talking about Horizon but perhaps there's a bit more to be learned. Are you there Hilary?

Hilary Benn MP

I beg your pardon, thank you Shearer. Just before I come onto Horizon Jamie can I just ask you one further question on the impact of the ODA cut which you referred to. What do you think that does to the UK's reputation in collaborative partnerships when having to do this all very quickly results in funding disappearing in a way that people didn't anticipate, what impact does it have for global Britain and how we are viewed?

Jamie Arrowsmith

I think it can only have a very serious impact on the perception, I think that what we have seen universities, because they're having sort of the flexibility and the resources have done everything they can to try and mitigate the impact of those cuts to sustain partnerships, so I think in terms of the actual activities everything possible has been done to make sure that they can continue but the fact is that there are research projects where there were legal commitments and contracts in place where funding has been put and I think that can only have a negative impact. As that was ironically those cuts were announced I think in the same week that the integrated review was published, I think there was quite a tension between the messages within that and the message that was being sent out by the cuts to ODA funding, so I think there is quite a lot for us to do I think as a community to sort of build that trust again, particularly with partners in the global south.

Hilary Benn MP

I see you nodding Martin, presumably you'd agreed with that?

Martin Smith

Yeah, very much so, the UK has been breaking its promises.

Hilary Benn MP

Breaking its promises, OK. Now turning to Horizon, the first question I wanted to ask is how damaging has been the long period of uncertainty between the referendum and participation in Horizon finally surfacing in the trade and cooperation agreement because you referred earlier I think it may have been you Jamie to the fact that we've gone down the league table when it comes to getting money, I think we were joint first, we've gone down to fifth it's been reported by one body, what impact has that had, that prolonged period of uncertainty. Jamie do you want to perhaps respond first and then I'll come to Chris.

Jamie Arrowsmith

Yeah, I'm happy to start. I think we have seen it in the figures, the fact that the UK's sort of participations did sort of fall quite significantly in the final year of the programme. We did still I think as I mentioned have, we were still the number one country in terms of the number of coordinations by the end of the programme and by quite some way as well so I think that sort of speaks very well. I think the framework programmes in general have been sort of a critical part of the UK funding landscape, they haven't just been a nice to have it's been a strategically sort of critical source of funding and resource, so I think there is a lot of ground for us to regain there, I think it was the uncertainty about whether the UK was going to be a participant which led to I think the number of coordinations sort of falling down in those final years and I think you know anecdotally there was evidence of the UK partners maybe being asked to be a part of projects but not take the lead in them because even the assurances that were given both by the UK Government and the Commission towards the end of the programme that the UK was still a full partner and it was underwritten, I think it was understandable that I think European partners did have some nervousness around that. So I think that did account for some of the drop off that we saw. I think it remains to be seen what happens with the new programme, Horizon Europe, again we need to ensure that the association is absolutely sort of finalised which is currently I believe sitting with the EU and we need to sort of make sure that those formalities are completed for the avoidance of any potential uncertainty in the future as well.

Hilary Benn MP

OK that's very helpful. Chris.

Chris Pearce

Yeah I mean maybe just to give you some context, University of Glasgow is probably very typical of a research intensive university, EU funding provides about 15% of our annual research funding from grants, annually we have about £190 million, so in context UKRI we get about 35% of our funding from UKRI so just to give you some context there. But participation in Horizon Europe is not just about financial, it's the collaborations and also actually it supports research excellence and we want to be a science super power so we need to be supporting research excellence. European funding facilitates major R&D collaborations as well as supporting knowledge exchange and enables really lasting partnerships to be developed, so over the last few years a lot of those partnerships will have dissolved, they have to be rebuilt or new ones have to be established and this takes time and it takes effort and there has to be a confidence that this is for the long term, if you want our

researchers to engage in that process. The other interesting thing about European funding is around the excellence bit and one of the major funding programmes is the European Research Council, recognised globally for supporting and promoting excellence, it's a €16 billion programme, supports the highest quality investigated driven research and there's nothing really equivalent to it in the UK and it's recognised globally for being really well established. And so, to give you some confidence maybe is that the data shows that the UK has historically been very successful in attracting EU research funding and in the latest European Research Council announcement that came out in April this year, the UK will now host the highest number of applicants, 51, of any of the countries participating in the programmes. But the ERC is an individual programme activity, individual researchers at all different career stages, whereas I think the more collaborative research funding partnerships will take longer to be established. But if we have confidence in the scheme, if we're in there for the long term I'm pretty confident that the UK will be successful because we have a good track record.

Hilary Benn MP

OK, that is really helpful. And finally Martin, would you like to say something about this, fairly briefly because of the time.

Martin Smith

Yeah, just briefly so yes five years of uncertainty, half a decade of our partners wondering whether or not the UK is going to be reliable. The irony is actually part of the negotiations about the UK joining was about the UK worrying if well what if that lower success rates continues we're not going to get as much out of it as we would do otherwise and then on the EU side thinking well what if their success rate suddenly recovers and they win all of the money. In practice I think we can recover and if we can't then we shouldn't have joined, we can recover but it will take a tremendous amount of communication to restore that confidence, particularly with EU partners to make it really clear that we are joining and that they should partner with us.

Hilary Benn MP

OK, that is really helpful, thanks very much. Shearer back to you.

Professor Shearer West

Thank you very much Hilary, we're running a couple of minutes behind but we'll try to catch up over the next two or three questions. I'm going to go now to Paul Blomfield MP. Paul, I think you're back after your other ...

Paul Blomfield MP

I wonder if I can move onto a slightly different area, I mean obviously the research community is an international community and immigration regimes are hugely important in terms of ease of movement, so I just wondered if I could have your reflections on how far the

UK visa system is fit for use currently by researchers, in terms of cost and availability but any other factors as well, and perhaps Jamie you could start.

Jamie Arrowsmith

Yes thank you. I think that overall the UK visa offer to international researchers and academics is relatively strong, we've got the global talent visa and the academic visitor visa and amongst other routes I think they've been really welcome. I would say that the thing that our members sort of raise continuously and we know that are raised by talent from overseas is the cost of the UK system and particularly relative to other countries. I think it was the Royal Society did some research on this a couple of years ago which looked at the main work route then, the skilled worker visa and did show just how expensive it was to come to the UK as a researcher and also to bring family and I think it was some UK modelling on this suggested a researcher with three family members, the upfront application costs would be £12-13,000 which is really significant and that I think excludes employer costs such as certificate of sponsorship, other costs to the individual, language tests, document translations and things like that. And I think an important point to recognise that obviously has a really disproportionate impact on our ability to attract research and talent from the global south because of those sort of high costs. I think there are some steps that could be take to help mitigate that and which we've certainly shared with Government and I think they would include enabling the costs to be spread over time rather than requiring full upfront payment, considering whether things like the immigration health surcharge, there's an exemption for that, could that be expanded to cover any academic staff working in the NHS as well and also exploring the option for sponsors to actually support applicants through for example loans upfront to cover the costs of that, so I think there are really practical steps that could be take to help effect, to help change that kind of really significant barrier of cost. I think also there is the question of complexity of the system, I think there are some proposals that have come out through the Office for Talent that have been discussed which would be really welcome, but I think they obviously need to be carried through and implemented. So I think the visa system itself is reasonably supportive, the costs are the problem and I think help navigating the complexity of that system would be really welcomed.

Paul Blomfield MP

OK thanks very much, how does the cost compare with our key competitors if you like?

Jamie Arrowsmith

So I believe it was not particularly favourably, I don't have the figures in front of my right now, I'm not sure if any of my other colleagues on the panel do but yeah I don't believe it was particularly favourable.

Paul Blomfield MP

OK Martin is indicating that he may have some of that information, so Martin.

Martin Smith

Yes, well I can quote what the Royal Society came up with, they were looking at the average of leading science nations for equivalent visas and they found that the UK was about five and a half times more expensive than others.

Paul Blomfield MP

Five and a half times.

Martin Smith

Yes. I think the other thing to compare it to is that if you're looking to attract EU researchers well they've got 26 other countries that they can move to visa free and I think the thing to say about, or rather the counter-argument you'll get is that you know we have essentially a fantastic system here, we've been a science super power, prestigious universities, potentially incredibly strong funding environment, well it's reasonable to expect that people would be willing to pay top dollar for something excellent. But I think that's all very well but you know I'm sure buying a Rolls Royce is worth every penny but I unfortunately do not have the money to buy a Rolls Royce and so that is not open to me, moreover if I'm being offered a Lamborghini for free with another country well then it makes sense for me to go and take that elsewhere. We're talking about people who are internationally mobile and in incredibly high demand and we need to be very careful not to price ourselves out of the system.

Paul Blomfield MP

OK many thanks, have we, following on slightly from Hilary's question, I mean have we begun to see any difference, your point on EU researchers, since we have left the transition?

Martin Smith

It's very hard to look at this properly because of course with lockdown and the pandemic the uptake of the global talent visa hasn't been as high as it might otherwise have been. There has been interest in it, I think in practice it would be a lot of people who are already in the country looking to renew their visa and moving onto this attractive GTV system. I think it's probably too early to tell at the moment. On the plus side we are joining Horizon Europe, I think that would have made a tremendous difference to the attractiveness to the UK if we hadn't been, but we will have to see. Maybe the other thing to put in this point actually is that if we're looking to increase the amount invested in the UK in R&D you also need a tremendous increase in the number of people there to spend that money in a sense, it's not like you can just gold plate everything and congratulate yourselves for having spent lots of money, you need people to deliver extra R&D and I believe today the Government is publishing its people and culture strategy and that includes and figure in it of about 150,000 more people working in R&D by 2030, 150,000. Now, there's about 100 months between now and 2030 so you can do the maths to work out the number of people net you need to increase by, so it's not just a case of trying to attract a few of the brightest and best, you know get a few more in, you need volume and you need to increase our own production of PhDs and we need people to come to this country to help us spend this massive amount of money.

Paul Blomfield MP

OK thanks very much. I'll hand back to Shearer now.

Professor Shearer West

Thanks Paul. I'm going to Roger Gale MP now.

Roger Gale MP

Thanks very much. We're all acutely aware of the fact that the UK has had a very strong science research base and has been for generations almost a focal point for research particularly into new medicines but other things as well. There's clearly a concern about the possibility of attraction to ... by the financial inducement or academic inducement, to establishments in mainland Europe, but one of the things that concerns me is the possibility of there being a different regulatory framework as applied to the product of research and I want to know if that's going to affect the attractiveness of the UK as a research destination. Is there going to be a difference in for example the approach to clinical trials arising from our departure from the European Union and also of course departure from the either constraints or approvals of the European Medicines Agency. Jamie?

Jamie Arrowsmith

Thank you. I'm afraid this is probably not an area I'm particularly well qualified to comment. However, I would suggest that I think it does link back to some of the issues we've already discussed and that Martin and Chris have raised around the discussions with research funding actually that you know partnerships take time to develop, they need stability and they need certainty and I think that applies as much to the kind of regulation and the underpinning environment as much as it does to funding, but the opportunities and challenges are around regulatory divergence I think colleagues on the panel might have a better sense of what they may be.

Roger Gale MP

OK. Chris?

Chris Pearce

Yeah actually I'm afraid I'm not in a position to answer the question about [inaudible 0:36:03.1] so maybe one of the others has?

Roger Gale MP

OK, is anybody? Martin, are you?

Martin Smith

I'll have a go, I'll try and pick up. So, in a way it's not just the attractiveness of the UK but it's also the basic functioning of research as well and I guess this is common to lots of other areas of the economy but the regulatory alignment makes things a lot smoother, but one thing that we've been looking at in particular is the free flow of personal data for research, so you can imagine this is absolutely crucial for health research in particular. So it was a tremendous relief that we did get a data adequacy decision that allows free flow of data without bureaucratic hurdles, but that's an issue that's never going to go away, there's always going to be this spectre of the UK's data protection laws changing and then that data adequacy decision being taken away from us, so it's a significant consequence of diversion. On clinical trials in particular I mean the data point applies to that very much so, there's an interesting line in the life sciences vision which was published a few weeks ago that says they will move away from the clinical trials directive, to be honest there isn't any more detail from that at the moment in terms of what that actually means in practice and really it's a case of the Government consulting very carefully about what they really mean here. It's one thing having it as sort of bluster and asserting sovereignty but another if it's really going to hamper our ability to take part in cross country clinical trials. And the need to do that is particularly key to areas like rare diseases where you can't just work within a small island as we are and expect to see statistically significant results, you need to be dealing with much bigger populations and so again it comes back to the point that science is all about international collaboration now and you need to make that as smooth as possible.

Roger Gale MP

Is the potential move from the understood international standard, if that's what it is, is that it sounds to me as though that could damage the credibility of our research.

Martin Smith

It's certainly very worrying, I want to see what the details of that proposal is, I think it's worth saying that the new clinical trials regulation has been on the cards since about 2014 and the reason why it hasn't applied yet is for a tremendous amount of work putting together a whole new portal and database to support international clinical trials and if we are not part of that and we're having to then make people submit their own forms and register it in our own way as well then yes that does start to make us very much less attractive.

Roger Gale MP

Well, it could presumably affect things like licensing.

Martin Smith

Yes indeed, I mean I'm not an expert on the functioning of the EMEA side of things in particular but again, you know the EMEA is talking about licensing for a very much bigger market, whereas the MHRA is nationally looking at a smaller one and we're all proud of the strength of the MHRA but inevitably when a business is looking at where they need to go through their regulatory hoops their bang for the buck I think would be relevant.

Roger Gale MP

OK thank you, I appreciate I've put you on the spot and asked you to answer questions that you may not be entirely qualified to answer but I'm very grateful to you for having shot at it, thanks very much indeed.

Professor Shearer West

Thanks Roger, and I think that the Commission is going to return to some of these questions in a later evidence session in the autumn, because they're quite important. I'm going to Tamara Cincik now who is going to move us onto global opportunities, so Tamara.

Tamara Cincik

Thank you Chair. What global opportunities may be available for UK science that were not previously, if any? To what degree are these dependent on consistent Government funding and therefore moves like the cut in development spending cause problems? I'm going to ask Jamie that question first please.

Jamie Arrowsmith

Thank you. I'm not sure what opportunities exist that couldn't technically be pursued previously but I think it is a question of sort of political will and the sort of the resources for sort of funding agencies to do it. I think as Chris mentioned at the start the UK's research output is incredibly collaborative, I think it's now around 56-57% even of UK research outputs are produced in collaboration with a co-author, institutions, UK universities and institutions are autonomous so can you know establish partnerships between institutes and things like that and there have been a kind of multiplicity of funding streams to support that international collaboration. We've touched on many of those, so Horizon, Global Challenges Fund and more recently a funding stream, the Fund for International Collaboration. However, all of those streams have both challenges with their sort of on-going funding and I think that is something we need to address. I think one area that we could look at and indeed probably should see as being right for consideration is the way in which free trade agreements and I guess the parallel negotiations and discussions that they offer could provide an opportunity to foreground the issues of research collaboration, UK commissioned our own research, in fact from the UK Trade Policy Observatory and Professor Winters on the panel, that shows that science and research they aren't prominent within FTAs internationally but there are some positive examples and the FTAs themselves are a constantly evolving field. Australia for example has been quite proactive at embedding references to enhance scientific cooperation into some of their agreements, I think the example with Singapore is one that always stands out, and that probably means that the recent UK-Australia FTA might be something of a missed opportunity actually in that there is an innovation section which I understand is a relatively novel inclusion, but there isn't any specific references to research collaboration or enhancing that as far as I'm aware. And so I think there's an opportunity for Government working closely with the university community to make a really robust and positive case for the way in which research collaboration could feature in those agreements and at least using the fact that those agencies and bodies are around the table to bring the strategic partners together to help facilitate better links, particularly between funding

agencies, you don't necessarily need to incorporate that into an FTA but there is an opportunity there by those discussions taking place.

Tamara Cincik

And have you sent that concept into Government as a piece of policy advice that you think that's a potential opportunity?

Jamie Arrowsmith

We have yes, including as I say the report that we commissioned alongside specific advice for forthcoming negotiations.

Tamara Cincik

And what has the feedback been on that from Government.

Jamie Arrowsmith

Well we're having, we're constantly sort of talking to them about it, we hosted a roundtable very recently in fact just last week about the UK-India free trade agreement to try and collate what the sector views on that would be, so I think they understand our position, I think it's about translating that into some concrete steps as well. And I guess just the final point, I won't labour the point around the ODA cuts and the sort of challenges that they have raised, but they were incredibly difficult for universities to manage and as we've already touched on the UK's reputation as a trusted partner and we just need to make sure that that doesn't happen again.

Tamara Cincik

Thank you, because the information I've had and apologies I'm not from the science world I'm from the arts, but the number of uptake of non-UK students into the arts universities certainly has gone down because of the pandemic, so there's that missed potential revenue from external non-UK markets going in at obviously at a lower level than your brains but I think that that's something to be aware of that if the income is not coming in from students and then the grants are more haphazard because of a lack of consistency potentially then that creates a great concern in being able to strategize moving forwards, that's what I'm picking up from what you're saying, is that correct Jamie?

Jamie Arrowsmith

I think if we're looking at recruitment into the sector I think that's a slightly separate point and in fact I think what we've seen at the sector level is that actually international student recruitment has held up remarkably well through the pandemic, not least because the UK system remained open, real flexibility for students in terms of being able to start courses online and so I think looking at the recruitment numbers on the whole they've actually remained very, very strong.

Tamara Cincik

OK that's really helpful to know, thank you very much Jamie. Chris?

Chris Pearce

Yeah, well I think maybe it's useful to think about your questions through the lens of post-pandemic as well as post-Brexit. The pandemic has been a really crucial reminder of the importance of science with UK research societies being at the forefront of the fight against the virus and this should not be lost post-pandemic. We've also shown our capacity to innovate rapidly, given the right support and this also I think really needs to continue. I suppose a little bit more philosophically I think there's been a greater convergence across the world on what are the globally important problems and threats that we face and since no one country can solve these alone, and again the pandemic has demonstrated this, I think the UK really most continue to cooperate and participate in global R&D programmes and use our science and technology strengths to tackle the challenges we face, whether they be future pandemics, whether it be the climate emergency, resource security or whatever it might be. And as a consequence of that economic benefit for the UK will also flow. I think actually I will labour the point about ODA funding about how it's eroded confidence. I mean it really enabled us to build vital relationships and achieve a lot of positive change, so it really feels particularly short-sighted to impose such drastic and immediate cuts that has really threatened to stall progress of vital initiatives all over the World. I think the other thing I would just say is that we should also learn from the pandemic that it is really difficult to predict future challenges and so I would argue strongly that it is important to continue to support long-term fundamental research across a broad spectrum of activities, recognising that's a very long term gain and part of that will be as big global international efforts, rather than make decisions now over concentration on specific topics. It's very easy for us to, from a policy perspective, say we know what the problems are going to be let's put all the funding in there. We don't know what the problems are and so I think really taking a broad base approach to supporting research is in the long term with providing stability is absolutely essential.

Tamara Cincik

Thank you.

Chris Pearce

Sorry and one final thing actually I would just say, sorry I should have said is that I think the World has also got smaller and we've got now, we've really quickly adopted tools that support much greater connectivity, so the opportunities for that global collaboration is there as well.

Tamara Cincik

Thank you, and lastly Martin.

Martin Smith

Thank you and exactly as Jamie says I don't think there was anything that was literally impossible prior to Brexit but there are things that are now being talked about that perhaps weren't being talked about before and as Jamie says one of those is trade and I think there's a tremendous opportunity for the UK to have a really careful strategic think about where it wants to build up its scientific collaborations. Great news that we joined Horizon but that needs to be the heart of or the first step of our international strategy to really build out from there as well. And the risk at the moment without a strategy is that as and when we do various trade deals with different countries it's sort of little pack ons and little bits and pieces here and there, without being something that can be more than the sum of its parts and I think as a strong scientific nation we'll be in demand and in that sense there'll be lots of countries that want to build this into agreements with us and we just need to make sure that we're really working hard on the agreements that are really going to make a difference to us.

There's one other angle and that's regulatory diplomacy, so we talked a little bit earlier about the importance of alignment of regulation, there's another angle which links into what I was saying about exerting that scientific super power type status and that's trying to lead the way in was the new things are regulated so the regulation of emerging technology. And pre-pandemic the Prime Minister at the UN General Assembly said next year I want to invite you all to a Summit in London to talk about regulation of emerging technology and at the time you know it was a really good thing to be doing and this is something where the UK could find a competitive advantage for itself, obviously the pandemic has put those plans to one side but I think it's an area that we can pick up again in the future.

Tamara Cincik

Thank you for your thoughts on this, I'm going to defer back to the Chair, thank you.

Professor Shearer West

Thanks very much Tamara, so our final question coming from Liz Saville-Roberts MP, Liz can I hand over to you?

Liz Saville-Roberts MP

Thank you very much Shearer. This question is aimed particularly at Jamie and Martin, but just to give a heads up to Chris, I'd like to come back to him on what he mentioned about the golden triangle R&D funding as well. So my question firstly to Jamie, is there a sufficiently strong relationship between the Government and science practitioners in the sense could you describe what the ideal relationship would be and how it is now. Could you also consider and forgive this for being sprung on you now, that of course we have the devolved Governments of Wales and Scotland and Ireland and Northern Ireland as well, if you could factor that, their ideal relationship as well into your responses, so Jamie first please.

Jamie Arrowsmith

Thank you. I think from the perspective of science practitioners maybe kind of Martin and colleagues can say a little bit more on that. I think from UUKI's perspective, so my organisation, we are a representative body so thinking about it from institutions' perspective,

we work very closely with BEIS [ph 0:51:12.7], with UKRI across you know the whole range of, the whole spectrum of issues around science and research policy. I think we do have a pretty good strong relationship where we can sort of very openly discuss our concerns and the challenges, opportunities and feed these in from the sector. That's what we exist to do as a membership body, we are not naïve enough to think that ours is the only voice or opinion but I do think that that opinion is heard. And actually one recent example that I would flag is something that we have already touched on and that is when it appeared that there was a very real risk that the cost of association to Horizon Europe was going to have to be covered from the UKRI's existing budget, there was what I think we could describe as a very intense period of engagement with BEIS, the issue was raised repeatedly with the Secretary of State, with the Chancellor and even with the Prime Minister and that we as an organisation alongside many others, including the Wellcome Trust made a very robust case that was backed up by real evidence based analysis of what that would mean for UK science if that gap was plugged from the domestic research funding budget but the really significant impact that would have, we made it very clear what that would look like and how damaging it would be and we were able to point out how it was counter to actually the Government's objectives that were set out in the integrated review for example. And although it was I think a very difficult period for everyone in that very short period of time ultimately the decision was averted and I think that is in part, in significant part because the sector mobilised quickly and made a really clear and coherent well argued case, but that that case was heard as well. So I think that is an example of where we have been able to engage with the Government, provide the evidence for the impact of a decision and achieve a sort of favourable outcome. That is obviously not always the case but I think it does show you know we do have those relationships at that sector level.

Just on the point about devolved administration I think this is always a really, really important point about how devolved administrations are engaged, particularly in science and research where we have I think in higher education it's clear that within the university community there are devolved competencies in the teaching and education space, but as far as possible we do try and present a UK science and research ecosystem to the World and I think it's really important that we do try and maintain that and that can only effectively be done if there is really good strong engagement between Whitehall, between the devolved administrations, between institutions and stakeholders from across the UK as well, so that we can maintain that UK-wide perspective, because I think that's really important for the UK's reputation as well.

Liz Saville-Roberts MP

OK thank you very much Jamie with the specific example and also the overview of the devolved Governments. And to Martin now as well.

Martin Smith

So does the Government listen to the research sector, I think that's yes and no as Jamie was saying. In one sense there has never been a better time or a stronger appetite for R&D from Government at the very highest levels the Prime Minister throughout Number 10, there's a lot of saying the right thing and I see a lot of what we've been saying reflected in the strategies that have been coming out, he was quoting a review in particular, he had a culture strategy, I think Madame Solway [ph 0:54:40.9] has really picked up on the culture point very well and all sorts of other areas where I feel as though he's saying the right thing but then as Jamie says we have these ludicrous situations where suddenly it looks like we might be looking at

a billion pound cut to research funding and then suddenly having to mobilise a huge campaign to stop the Government from doing something that's just really stupid and completely the opposite of what they're trying to achieve. So you could look at that positively and say well they listened in the end but I don't think we should have been in that position in the first place really in terms of if Government were joined up. And the other example of that is of course ODA cuts where perhaps it wasn't really realised that cutting back on this is now actively damaging your science agenda as well and ultimately it's fallen to universities to absorb the difficulties of that and try and make things work, so we haven't had success at that end of things. But I guess I'm an optimist at heart and if those targets really can be delivered on in the spending review and maybe this new Number 10 unit on science strategy can really bring those different bits of Government together and really drive that agenda through Whitehall then we could be looking at something really good here. There's definitely though plenty of wobbles and silly situations that would make a pessimist seriously question whether or not it is going to be delivered on.

Liz Saville-Roberts MP

OK thank you very much, [inaudible 0:56:11.7] but it's almost the concern about the short-termism and it's easy to make the right noises than it actually is to ... thank you very much. Chris if I could come back to you I'm very interested in what you've mentioned about the golden triangle funding, we know that I think it was 42% from Royal Society analysis of ONS data in 2017 went to golden triangle institutions, 7% for R&D, 7% went to Scotland, 2% went to Wales, 2% went to Northern Ireland. What would we like to see here if I could just ask a fairly straightforward question?

Chris Pearce

Well I mean first of all let's be clear, the institutions in the golden triangle are world class, and I wouldn't want to suggest anything other. But there is so much diverse talent across the UK that we are just would be naïve and silly not to recognise that and to utilise it and to take advantage of it. So it's really just saying you know yes of course you know we must maintain Oxford and Cambridge and the others as world class institutions and I wouldn't ... but let's look at how we build up the rest, the other parts of the UK to get to that level, I'm not suggesting that we want to erode what is already excellent, and we have excellence elsewhere. I mean in Scotland alone we have two of the top 100 universities in Scotland. So, I think it's just about recognising that there is talent and potential across the whole of the UK and we must utilise it.

Liz Saville-Roberts MP

Would you expect this and if so how to be part of the levelling up agenda because we don't yet have criteria for this?

Chris Pearce

I think absolutely it needs to be part of the levelling up agenda. I mean I think the levelling up agenda is quite an interesting one because on the one hand we want to be, we're talking about being a global super power and on the other hand we're talking about how we ensure local economic prosperity from, you know flowing from our science and technology so there

is an interesting balance to be struck there to get that balance and actually to be honest I'm interested to see how that will emerge and I don't think we've quite got the answer to that.

Liz Saville-Roberts MP

Diolch yn fawr iawn, thank you very much. Back to you Chair.

Professor Shearer West

Thanks Liz, we've got one minute and I would like to ask everybody in one sentence if there was something you'd like this Commission to recommend what it would be, can I start with Martin?

Martin Smith

Yes, I think from the lens of this Commission the thing to push on is that real strategy for embedding questions of science collaboration in trade deals, I think that would be the most useful thing. In a broader sense I think the biggest issue right now is will the spending review give us the planned figures to take us where the Government says it's going to go to.

Professor Shearer West

Thank you. Chris.

Chris Pearce

To provide long-term stability to R&D such that we have a clear long-term, decade long programme of activity which is not subject to very quick political changes.

Professor Shearer West

Thank you, and Jamie.

Jamie Arrowsmith

Yeah absolutely I think its long-term, sustainable investment in cash terms in R&D.

Professor Shearer West

Thanks very much, that's very clear. And thank you all for answering the questions so openly and for joining today. I'm now going to hand over to my fellow Commissioner Geoff Mackey who is going to do a session on commercialisation and innovation, thank you everyone.

Geoff Mackey

Thank you very much Shearer and excellent start to the day. It gives me great pleasure to move onto the second half of the session and could I start out by asking the witnesses to introduce themselves and do a short introduction please? Irene, would you mind going first?

Irene Graham

Of course and thank you very much everyone for inviting the Scale Up Institute to come and speak with you today. The Scale Up Institute is a private sector led organisation that is focused on making the UK not only a good place to start a business but the best place to grow a business and that is important because the OECD has reflected that we're third in the world in starting businesses, but we are 13th in the world at scaling them up and scale ups are a vital element of our UK economy, the scale ups today are around 33,400, they contribute 1.1 trillion to the UK economy. They're SMEs so 5.9 million SMEs contribute 2.2 trillion, but 33,000 of those contribute 1.1 trillion. Those businesses are highly innovating, highly international and at the centre of that is their desire to do even more innovation and access the right R&D opportunities both with the public and private sector and indeed the international opportunities that go with that. So this is a very key element of their access to market so it is important to them alongside talent and growth capital. Scale ups are across all sectors of the economy including life sciences and all areas of the economy, so they are a vital component also to our levelling up agenda which you've just heard about and staying ahead in the innovation and R&D space. So we're delighted to be here today and obviously looking forward to the more detailed questions that we'll have to answer.

Geoff Mackey

Irene, a great commercial frame to start with, thank you very much. Geeta, would you like to introduce yourself please? Geeta, you just need to unmute yourself please, I do apologise. No worries.

Geeta Nathan

Sorry, good morning. Geeta Nathan at Innovate UK, Head of Economics, and Insights and yes, in terms of Innovate UK its main focus is on supporting businesses to innovate and a lot of emphasis currently within Government circles, BEIS is announcing its innovation strategy this afternoon, so it's quite topical today's discussing in terms of commercialisation etc. And also Innovate UK is also going to be launching a business innovation strategy in the next couple of weeks so it will be a good opportunity to share with you some of our thinking and what we're planning to do in terms of supporting businesses that innovate as well as thinking about global opportunities as Irene said, scaling, how to support businesses to scale, thinking about funding and really taking advantage of the excellent research base we have in the UK and how to have the most impactful impact on the UK economy.

Geoff Mackey

Thanks Geeta, that's excellent. And Naomi a personal introduction please just to finish off.

Naomi Weir

Good morning, I'm Naomi Weir, I'm Head of Innovation at the CBI, thanks very much for inviting us along this morning. So at CBI we really see this as a reset point, a real opportunity to respond to the various shocks and threats on the UK, whether that's thinking about the pandemic and recovery, thinking about new relationships with the EU and thinking about the climate imperative together, each individually would be enough but together there's a real imperative and a real drive from business and desire from business to do something better and different. And to the discussion on this panel what our relationships are like with the rest of the World and the role of innovation both in that and in driving what kind of economy we want to build in the future is completely central to that, so really looking forward to the discussion.

Geoff Mackey

Thank you very much all three of you. We're all slightly limited by time in what's going to be a really interesting panel. I'm going to take the luxury of the first question if I may? We're often told, and there's lots been written about the UK being poor at commercialising our world class research, are we particularly strong at research, bad at commercialisation or what do we do about it, what's our strengths and weaknesses? Irene, as a good starting point would you like to fill that one in please?

Irene Graham

Yeah, thank you very much for that wide ranging question. No, we have an excellent research base and we've acquired that from the prior panel and we also have an excellent corporate and commercial and scale up space. What we're perhaps not as good at is joining those together in as integrated a way as we can. Now we've got the ingredients for that, UKRI and Innovate UK as a collective body with the academic side and then the business side in Innovate UK are very vital and are going to be very important as we drive forward with our innovation strategy with also the Government's life science vision. But we must get that inter-connection between academia and business and commercialisation as succinct and efficient as possible and that's where our scale ups are saying you know we want to do more with universities, we want to do more with Government in the collaboration space and the R&D space and at the moment there's probably three in ten collaborating in that space with universities, so much more opportunity in that regard. The other area that we have to continue to develop and the Government commitment to this is important, we must get to that 22 billion of R&D expenditure, other countries like Germany and South Korea expend more in R&D, we need to be able to continue to do that and to make sure we're connecting that directly into the businesses and leveraging the ingredients that we have, as I say with Innovate UK, their Edge Programme, the British Business Bank and really have them at scale and have a consistent and long-term strategy towards this, that's a very vital component so countries that are ahead of us in this area they have very long-term strategies and they leverage the long-term structures that they have, whether that be the small business administration in US, KfW in Germany, we have those ingredients, the British Business Bank, and Innovate UK and UKRI are vital to this and we must continue to develop them and that opportunity for commercialisation, engagement between the scale up economy and the business economy with that research economy, so that's some of the points that we see as being important going forward. Sorry, I'm not sure if other panellists ... I can't hear you.

Naomi Weir

We've lost you Geoff. Shall I come in, is that useful? Great, I'll come in. So I would very much agree with what Irene has said, thinking about some of the other areas as well, you know I think one of the biggest things is in part the question, I think the people who say we're bad at innovation are largely us and I think when we're talking about building confidence in a place to invest for businesses we're much better than other places who have a much better comms story to tell about their innovation, so I think ...

Geoff Mackey

Thank you Naomi.

Naomi Weir

No problem Chair, any time. So I think you know there's certainly something to do about our comms, but also the ease of navigation and understanding what's out there, so there's telling the story of the UK and what we are really good at, you know we are a place as a tech hub, the investment in the UK is enormous compared to other places around the World, you know thinking about what we've done in fintech, we're a really great place with real potential round AI application, think about genomics, there's loads of areas with real potential for the UK where we kind of have a potential to do really leading edge interesting stuff, but we need to be able to be better at talking about that, both as a nation but also from Government as well as how we talk about that but also how we articulate what the offer is and enable businesses, either those starting, scaling, corporates, to understand and navigate the system, both those already here but also those looking on internationally as to how to get plugged in to what is you know a really good innovation system, that said there's also more to be done, I'd echo what Irene has said already, but I think you know we've seen in the pandemic that the UK has real strength in this, but we also know that was quite extraordinary times and some of the barriers that were overcome due to a real shared goal between business and Government, a real urgency and a real focus meant that some of the barriers, whether that's to do with agility and swiftness of funding, whether that's to do with regulatory flex, trying new approaches, whether that was joined up between different sectors or different parts of the economy, those were overcome under quite extraordinary circumstances and we don't want and won't have all of that again, but actually what can we learn from that to build that into our business as usual systems. So I do think we've got a better story to tell than we do, but there are things we can do better to make the most of the assets we have and build on them, and I very much echo Irene's point and I know the panel previously that we do need to move into actually delivering on the commitments we've made and the innovation strategy due out later today will do part of that, that needs to then be long-term and backed with the funding it needs to actually deliver.

Irene Graham

And Naomi may I just pick up on a point as well that you've made there and maybe just to make that very explicit, clusters are very important, we have some very, very good clusters here, when we look at the local drivers of growth there are three ingredients, access to skilled

talent, access to clusters and hubs and access to long-term growth capital, so also looking at the clusters that are around this country in the green economy, in fintech, how we develop them further are going to be important as well and that's an important strategy to this R&D space as well.

Geoff Mackey

Thank you Irene, Geeta without asking for any particular comment on the innovation strategy that appears, would you just like to pick up the question of commercialising innovation and strengths and weaknesses please?

Geeta Nathan

Yes sure. So the area, sorry there's a lorry outside. The area that I wanted to really pick up on was that I sort of feel that there's two areas to look at, one is if we look internationally yes we are actually doing really well, so according to the global innovation index we're number four in 2020, so we're doing pretty well out of 131 countries. But I do think there's some key areas that we need to think about when we specifically think about commercialisation. So talent and skills, one of the areas of weaknesses and both Irene and Naomi have raised this that have our businesses got that entrepreneurial, that leadership skillset to really think about taking their invention, their research and then commercialising it and what do they need in terms of those skillset, that risk element as well as thinking about actually going wider and further in terms of reaching wider markets, globalisation. So for me there's something here about really nurturing talent to support that and we've already seen that the Government now has announced a programme earlier on in the year, Help to Grow, which is going to support smaller businesses with their management and leadership skills. So I think there's recognition within Government that you know these are key areas to help that development of commercialisation of innovation but there's still a lot more to do. I think the point that Naomi makes that there's the innovation ecosystem, we have a huge number of players, there problem where our area of weakness is coordination, like we have lots of players doing some great things but it's making sure when a business, be it a business coming from abroad, a domestic business, when they start that journey they know where they're going and who to go towards within the different supporting bodies and that that's a really clear path. I think for me that's one of the things in our innovation strategy is about building the innovation ecosystem, both at a localised level and making sure we've got the right players there, but also a national level so that we've got that level of coordination, and one of the things that we're sort of trying to determine is who is actually the coordinator of that, who coordinates the overall innovation ecosystem, be it at a local level, be it as a national level.

So there's some real key areas and you know as I said our business innovation strategy does focus on some of these key issues, but I think also the other area that's been touched on is if you look at the global innovation index, one of these areas where the UK does fall is institution and political weakness, and so again we have been in you know a constant political cycle, we've had spending reviews which are very short in length, we don't have sufficient longevity of spending to really see the impact of some really great initiatives, things start, then they stop, then we don't get to bear the fruit of what those initiatives were. So again, thinking about it from we're currently going to be heading into a spending review, it

would be great to see Treasury and BEIS give that longevity to funding to make sure that we are able to put in place the right measures to support businesses to innovate.

Geoff Mackey

Thank you very much, that's a really good way of setting the frame. Could I ask Caroline Lucas MP to pick up that please?

Caroline Lucas MP

Thank you so much to Geoff and thank you to all of our guests and witnesses. I wanted to come with a much more specific question if I might and that is around the fact that most of the focus in research and commercialisation might well be going to come in tackling the climate emergency, at least I hope it is, so how is the UK positioned in that field in particular and what more could the Government do, and maybe I could start with Naomi on that.

Naomi Weir

Thank you, I think first thing to say on this is innovation will be critical to tackling the climate emergency but it's not just going to all be at the cutting edge, it's both adoption of existing technologies, processes, ways of improving moving towards decarbonisation but also, we're going to need some new technologies, new development as well, so both of those things and they have quite different levers and quite different motives behind them. So I think you know we've got some good things in place in terms of you know setting the target from Government, a ten point plan and sort of emissions reduction target, but we're starting to lag behind some of our counterparts in terms of policy and delivery on ambition which is a slight recurring theme, you know for example of hydrogen multiple countries have already published strategies whilst the UK still waits for a strategy that's been promised for six months or so, you know businesses are making decisions and thinking about how they do these things in quite a global context often and the UK needs to make sure that we're not losing pace on that. So we need to start delivering really clear policy and funding mechanisms to stimulate that business investment required to unlock the UK's decarbonisation potential. And I think you know this is such a wide ranging area in terms of innovation adoption that is something across the board that we've traditionally not been brilliant on and had wide market sort of penetration in terms of whether we're talking digital technologies or whether we're talking other, and so I think how to support particularly kind of the wider base you know particularly our wider SME base as well as our larger corporates, but to take those measures to adopt technology. And I know at CBI with part of our new Seize the Moment strategy decarbonisation is one of those key themes and we'll be looking really carefully at how we can both support and inform the Government agenda as well as really help businesses to take a lead on moving towards decarbonisation. You know it's a cross cutting and complex issue but we really need to use all the levers at our disposal so one thing isn't going to be enough, you know R&D funding on its own is not enough, support to adopt technology is not enough, a new regulatory, it does need to all be combined, so that coordination and you know maybe of infrastructure of regulation rather than just the new technologies is going to be critical. And I think you know the UK's potentially in a really good place to deliver some of the technology solutions that the rest of the world would really be

interested in, so it does really reflect on that export potential as well, so that's not the purpose of that agenda but actually there's real multiple wins for the UK in that space.

But again, you know business needs the confidence to invest and that's where the public investment lays that foundation for private investment and so you know we think about maybe you know the aerospace technology institute or Fly Zero in aviation and putting real weight behind perhaps emissions based approach in the innovations strategy, you know those things will help. Or take ARIA, the Advanced Research Invention Agency, it has potential but crucial to its success will be giving that new agency a real challenge to solve and this seems to be a very good one, it's wide ranging, it cuts right across sectors and industries because everyone needs to be part of tackling this and so some sort of real sort of high risk high reward mode of tackling some of the challenges could be another good way of doing it.

Caroline Lucas MP

Fantastic, thank you so much. Geeta have you got anything you would like to add to that?

Geeta Nathan

Yeah, I think I sort of agree with everything Naomi is saying, I think there's a huge opportunity for businesses for the bigger sort of social goal of climate change. I think we've also got in a way we've sort of reached a perfect point where we've got Government commitment, yes Government has to sort of work in terms of regulation, policies, coordination, but we've also seen consumers are now starting to become a lot more aware, we're also seeing businesses, they're also starting now to take this seriously. So you've got a perfect storm coming together and really what you need is that, I think, as Naomi has highlighted, that coordination and that drive really to push all the different actors together. UK businesses are sort of well placed in certain sectors, oil and gas, offshore, digital, automotive, aerospace, we've got some really fantastic research that's there but it's now really for businesses to start thinking about how to scale, how the adoption and diffusion takes place as Naomi said, that is going to be critical, the long tail of businesses, we could have just a small few large businesses really powering ahead but if we don't get the vast majority of businesses on this path that is going to be where we are going to get the real challenges, and it's thinking about how Government policy can incentivise, support business to start diffusion and adoption of these greener technologies.

We also need to think about how we're going to promote businesses in terms of investing in technologies as well, in terms of thinking about the continued innovation that's going to be needed and also the regulation standards, we seem to be always behind the curve in terms of regulations and standards being delivered at the same pace as technology, so again from a Government perspective really prioritising what standards need to be in place and ensure that they're incentivising businesses to take those risks really with the right infrastructure in place. And I think the last area for me is also going back to the ecosystem, it's really thinking about what do we need in an environmental ecosystem really to support businesses to take this challenge on and have we got the right players in place, and if we don't take the right measures in quite quickly we are going to end up being a country that imports technology rather than become an exporter and that will be a real challenge for us because we will not have the talent, we will not have the investment and as a result we will be just importing everything and that doesn't do our economy, doesn't put us in a good place.

Caroline Lucas MP

Thanks, Geeta. And finally to Irene and in particular maybe picking up this theme about the urgency and what we can do to kind of accelerate this because I think everyone's singing from the same hymn book and yet still we're not seeing what we need to see fast enough.

Irene Graham

Yeah I think that we've got a very, very burgeoning green economy, we've got thousands of scale ups in that space and there's about 282 of them breaking through that ten million barrier there generating nine billion to the economy, 1.3 of that billion is in exports and they're employing individuals across the country. We've got really emerging ... plus this is a real opportunity in our completely UK agenda, whether it be in Scotland, Leeds in Yorkshire, South-East, that whole economy to really take that green agenda forward and I think we've got the levers and the building blocks for that. But what's going to be important to drive it further forward, we have got to have the long-term interventions, we've got to expand upon, innovate a challenge fund opportunities, we've got to look at and if you've not seen this we'll certainly share this afterwards, the open data energy, open data is a very vital part to this and the sharing of data and there's some very good work emerging on that with ice breaker and the open data energy environment that Innovate UK has supported and I will share this paper with you subsequently because it's really vital that we see that continuing. That's a really important generator as we've seen with open banking and what that has generated in fintech for further developing our net zero economy and taking forward the green economy.

Then we've got to have the long-term institutional investment and we've not yet properly touched on this but it is very vital that UK institutional pension fund and insurance fund comes in to invest in this economy and that's why it's very important, a number of the things that are taking place at the minute from the early stage it's the innovation lanes and the grants that Innovate UK put in that can generate the scale in the green economy and we're seeing that directly in what Innovate UK funding crowds in. The next stage is how the British business bank with its patient capital actually supports that green economy agenda and the breakthrough fund announced this week is going to be very critical in that. But then we've got to unleash that institutional funding, so the focus at the minute on the pension regulations, the insolvency regulations and the listing rules are all going to be vital because we need that institutional funding coming in, that's what Canada and the US and others ...

Caroline Lucas MP

Is that a barrier?

Irene Graham

That's a barrier Caroline and it's one of the things that we really need to address. Now the Government is very focused on that, we need to see that driven forward in these coming months and years for that acceleration and making sure UK capital does come in. We're very good at attracting international capital but they go a lot into the SASS platforms and internet platforms, not so much the green clean tech, so that's where the breakthrough fund as I say has been developed and may have to be built upon. So those are going to be important ingredients going forward and I will say Innovate UK is really important, we've talked about commercialisation, one of the programmes that was based in Europe first under the European Enterprise Network is now Innovate UK Edge and that's very important in working

with these companies in getting them access to the right resources at the right time, and so making sure we expand upon that is going to be important too as well as we've already heard from other panellists around Horizon 2020, having those ingredients deployed, but this is a very regional, national opportunity.

Other aspects that we think are helpful, the FCA has the scale up box, do we need something similar in this green economy, how do we fast track businesses in the green economy into Government procurement, into Government collaboration and working with our corporates and what role does UKRI and Innovate UK play in that.

Caroline Lucas MP

That's incredibly helpful, thank you so much I really love all those very specific proposals, that's fantastic, thanks. Handing back to you now Geoff and just to apologise that I'm sorry I'm boxing and coxing with other meetings this morning but I will catch up with it all in the minutes afterwards, thank you.

Geoff Mackey

Thank you very much Caroline. Irene and others if you do wish to make written submissions in addition to your oral evidence please do, that will of course add to our evidence gathering which is part of the conversation to get as wide a picture and as complete a picture as we can, thank you. Could we move onto Commissioner Andrew Ballheimer please?

Andrew Ballheimer

Thank you Chair and thank you to each of you for clear evidence. You know picking up on the opportunity as [inaudible 1:24:57.2] you've obviously heard about many of the challenges but as we look at the opportunities as a result of Brexit you know how essential are those opportunities in terms of you know for example sort of emphasis on buying British through the procurement sort of approaches or deregulation, I'd be interested in hearing from each of you as to your thoughts on that. Maybe if we do the reverse order, so Irene first if that's OK?

Irene Graham

Thanks very much, look irrespective of whether we were in Europe or not, I mean we have had a challenge at scaling businesses for decades and one of the key levers that we see other countries use really well and the US is a real example is procurement, the small business administration dictates a level of procurement that has to happen with the SME economy and the scale up economy and we think that needs to be further developed here in the UK. Now I'm hoping in the innovation strategy that gets announced shortly there will be some referencing into the procurement and how that can be developed but how does Government become an anchor client, how do we leverage and fast track businesses that are being invested in through Government programmes into actually procurement and collaboration and how do we build on the great work we have in the example of the FCA scale box in other sectors of the economy. And I think these are really important ingredients for us to develop and build upon and we have a real opportunity with the SPRI to do more

with that. So those are some specific things and we certainly will provide you some written evidence on that as well.

Andrew Ballheimer

Thanks very much, and to Geeta.

Geeta Nathan

Thank you, so in terms of thinking as well about the new subsidy bill, I think that's going to provide British businesses a lot more flexibility in terms of how subsidies can be given and we're also expecting that you know the structure of it will give Government flexibility as well as the type of support that can be provided. And what's interesting is that it's also giving the opportunity for Government now to think about subsidy in terms of its strategies and its policy objectives which is a really, you know a new element which also provides a lot of opportunities for example it can align to Government objectives such as net zero, levelling up etc and think about what subsidies are needed for those specific themes, which we've not had that opportunity in the past. It also is going to give us more scope for smaller businesses as well as larger projects actually to happen which in the past have probably been more challenging under the EU subsidy state aid rules. So I think the opportunity is there, we've now got to build on the detail. I think also the other element that's coming through is that it's going to also protect the public purse and that's going to be critical as well, so I think on many levels we've now got a golden opportunity to take, it's really how those subsidy regimes now start to emerge over the coming months and years.

Andrew Ballheimer

Are the Government on the same page in terms of helping in this initiative?

Geeta Nathan

Sorry I didn't catch the question.

Andrew Ballheimer

Are the Government on the same page in terms of helping, in terms of the support?

Geeta Nathan

Yes, I think so, I mean the challenge is going to be the speed at which things move, but I think there is definitely the appetite now to really take advantage of this opportunity to reshape subsidies in terms of what we've had in the past with the EU subsidy state aid compared to what we could have, and particularly I think that bespoke element is going to provide a lot of opportunity.

Irene Graham

And one thing maybe Geeta to add in some of the things that the Government is doing now is looking at the day to day whole and how do we actually identify the companies that can be bought from and fast tracked in and I think that's a really important element, how we build on something called the Decker [ph 1:28:38.2] Project, yeah how do we get and identify these businesses quickly, get them into being operating with and collaborated with support from, so that's another area that's got to expand.

Andrew Ballheimer

Naomi.

Naomi Weir

So I guess two things, so thinking about regulation you know just as for example tech is global, innovation is global, regulation is global, businesses are operating in a global environment, obviously you're thinking about export and kind of trade particularly. You know firms are now particularly sensitive to the difference in operating environments globally as they decide where to locate, invest and innovate. So that needs to be kept in mind as the backdrop, although there's opportunities to do perhaps some things here in the UK, so Irene's point around what we've seen with the FCA and fintech, but you know the pandemic has created uncertain economic environment for businesses to layer on top of our new relationship with the EU and many firms you know struggling with lower cash reserves to invest in innovation are concerned about the impact of future regulation on the UK's kind of digital dynamism, so thinking about digital regulation in particular because that's quite cross-cutting in terms of sector, it's not just affecting tech. And you know firms are really navigating how to operate in that environment, so many more firms are operating in a digital space now, particularly post-pandemic but it's a really key thing to get right. So we must do I think more to remain kind of that digital power house and you know as new forms of regulation are developed there's a real need to reduce fragmentation, so to enhance expertise, increase coordination across Government and regulators because so many regulators have a role in the digital space, you know and firms, you know really welcome the Government's digital regulation strategy on this front but that's a real area where we'll need to have real coordination and future thinking in order to make sure that our regulatory environment really can provide a great place for the UK to innovate but also as kind of a leader in that, you know something that we have potential to be really good at and be an additional attractive part of our innovation environment if we can get that right.

Thinking about procurement to your question, I think in many ways the long-standing challenges around procurement haven't necessarily been to do with what's possible but been to do with how things are done and how rules are interpreted and at the sort of processes and the training and skills for those involved with procurement. So you know some of the challenges that we've heard from businesses is you know a disproportionate focus on short-term costs, you know the green paper that's come out recently with proposals to streamline procurement processes, move away from most economically advantageous tender just to most advantageous tender is really great for thinking about innovation, you know streamlining some of the regulations and procedures are really good but I think the vast majority tell us that you know supply issues are driven not by the rules but how we apply them, so sort of gold plating of current legislation and so that's within our gift to change regardless, that this is an additional opportunity and incentive to do that, so I think that's probably the big area as well as the actual law changes themselves in terms of procurement. But certainly as we engaged with members on the innovation strategy procurement came up

again and again as a really big lever that the Government has if it's really serious about innovation that has to be pushed in the same direction as their goals on innovation and you know I haven't mentioned it yet but it does come into quite a lot of these areas is our kind of appetite for risk and how we see that functioning in terms of innovation, it's something culturally both in it's sort of steeped into our business as well as our Government.

Andrew Ballheimer

Well they're linked aren't they?

Naomi Weir

Well, quite.

Andrew Ballheimer

If you don't take risks how do you innovate?

Naomi Weir

Exactly, and I think so that risk appetite and kind of what that looks like in terms of our procurement, is it proportionate, so we've had businesses say actually engaging on a particular procurement contract, as long as it's above a certain size it feels proportionate, but actually when the size of the contract decreases what you have to do in order to get part of that doesn't feel proportionate and therefore it's not worth it. And so I think that's related to risk and appetite for going well can we do this with a slimmed down process, yes it involves more risks but it's about something smaller and making sure that we've got proportionate things in place for procurement, both in terms of with risk in mind. So I think that's really helpful, both for innovation but also for thinking about how to bring more players into procurement.

Andrew Ballheimer

Thank you very much everyone, I'll pass you back.

Geoff Mackey

Andrew, thank you very much. Could we move onto Commissioner Alison Williams please?
Alison.

Alison Williams

Thank you, morning everyone. I wanted to focus on the theme that has kind of come up already this morning around international cooperation and get your views on how impactful that is on our ability as a nation to commercialise the innovation and IP and research that we've been talking about. You know has Brexit impacted the role of international

cooperation, should we be focused on that as something that's going to enable us to commercialise more or in a better way. So if I could start with Geeta please?

Geeta Nathan

Yes, so just in terms of thinking about global collaboration and partnerships, I think it's really important to look at the evidence and if we look at businesses which have worked on Horizon Europe, on Eureka programmes with the EU there is overwhelming evidence that business turnover increases, employment increases and firms entering new markets prove to be incredibly beneficial. So with that starting point I think it's really important to think about how do we nurture future relationships and also make it sort of setting the point that it's not an either EU or others, it can be both and it's identifying for businesses which are the most, which are the best partners, which are the best markets and I think one of the other areas that we're also trying to work on at Innovate UK is that clearly the domestic market is relatively small, but also making sure that early stage businesses do not go abroad and base themselves there because of a larger domestic market, or because of opportunities for increased funding and it's thinking about again the ecosystem, what do we need to have in place to support these businesses. So, as Irene has mentioned we've got our Edge programme for business support and within that is a global innovation programme which really supports businesses to reach out to international partners and really focus on really helping them to expand their markets and I think for me that business support element, particularly for small and micro businesses that they need that support, they don't have often the time or even the skillset really to understand how do I go and you know set, you know get established in another market. But also it goes back to that cultural element, for many businesses I think they're just happy to be in a domestic market and they haven't got that growth mind-set and it comes back again to that leadership of businesses, so for me there's something really here about how do we nurture businesses really to think about big scaling and moving and thinking about international markets.

I also think it's really important also to think about the fact that what benefits are we still going to get from the EU, it isn't a market that's suddenly closed its doors and we are still going, we've still got opportunities through the Horizon programme and there is significant funding for our businesses to take opportunity for, so Innovate UK is really trying to publicise the fact that this still does exist, we're an associated partner so we still can access those benefits. And I think that's really important that businesses see that. And it's also understanding how that's going to help them with their supply chains as well as their networks across the continent, but again going further afield, and I think there's also something to think about you know that what we get from being an associated partner, we still are able to access EU and you know for example EU and Japanese collaboration in terms of the benefits we can get from those existing infrastructures. We've also got Horizon European missions, so things that we can really benefit from. So yes, we're in a different type of relationship but I don't think we're in a relationship where the door is closed and now there is a great opportunity working with partners such as Edge and other business support organisations really to reach out, for our businesses to reach out to further afield and think about where they can expand their markets.

Alison Williams

Great thank you, yeah that's really clear kind of the two sides of having the right mind-set and then actually building these partnerships and collaborations. Naomi do you want to chip in at all?

Naomi Weir

Thanks Alison. So I think, I mean the answer in part is yes, I think you know innovation exists in a very international environment, you know thinking about partnerships one of the big areas of that is around trust, that's why you know when you think about research or innovation collaborations it's often with partners that people know or trust or if you've had a good relationship and partnership before you will go to that again because you know it works and you can sort of trust those outputs of it. So thinking about trust, aligned aims, certainty, lots of that has been eroded somewhat with the UK as being a trusted partner in recent years, but I think actually what we've seen in part in the pandemic is how the UK has played a real important leadership role globally in terms of innovation and partnership on that and so I think there's an opportunity here in terms, you know it's important the UK's sort of brand are being seen as a trusted partner is really helpful for our businesses and for others looking to make those collaborations. So that needs to be built on and actually anything we can do around long-term certainty to some of the previous discussion around you know long-term certainty, around funding, around programmes, around infrastructure will really help with that because they can know well we can depend on that, we're not going to have the funding pulled away last minute, etc.

I think Horizon Europe to the point that's already been made, we I think you heard from Martin in the previous panel, you know we avoided an interesting situation in terms of the funding for that for year one, everything else beyond year one is in play and the spending review needs to have a really strong answer to that, it was previously out with phased budgets and so you know yes you could tack it into that 22 billion but really all that's doing is just reducing the amount you're growing your domestic expenditure, so it works from an accounting perspective, it's less good if you want to really become a global leader on innovation. So thinking about how do we answer that to make sure that again we're a trusted partner and reliable partner for those businesses that are seeking to engage through the EU. And I know previous panel also talked about the role in some of those trade relationships too.

I think from our members we asked them about some of this international innovation and what's most helpful, some of the things that came up were around finding partners, were around expanding opportunities for funded collaborations with global leaders, US is sort of mentioned as you say, and I think some of that is again due to that sort of long-term and enabling quite flexible funding in order for businesses to find partners. There's obviously questions there around some of the legislation coming in around national security and investment and that does have some question marks about what that looks like in terms of where funding can come from for some of these things and making sure that that doesn't make it much more difficult to form those partnerships and kind of make it feel like the UK is a difficult place to come and invest and do partnerships of innovation will be really important.

Alison Williams

Thank you. Yeah your point around trust and having that kind of long-term view and investment really resonated and I think it's something that's come up in quite a lot of the discussions with other industries as well. Irene is there anything you want to add?

Irene Graham

Yeah I would I mean I think the short answer is it's essential, it's vital, our scale ups are looking beyond Europe and the UK, they're looking at Asia, they're looking at the US, they're looking at the Middle East and Africa and increasingly so. We've also got to differentiate in our SME market, SMEs probably export about 9.8% of SMEs export 50% of the scale up economy within that is exporting so it is vital to Geeta's point the global innovation programme and the scale up programme within that is really important and how we can get more dedicated scale up trade missions that we see happening in London and Manchester and around the country are going to be very vital and it picks up the points of then getting the right connections into collaboration overseas as well as the right opportunities. With that goes the funding, so UK export finance has a role here and more of that is expanded into the business economy, we do need to recognise businesses actually are very trusted and actually being bought from overseas we have a role to make sure our UK businesses, our scale ups, are connected to those opportunities in a very structured way, so innovation partnerships will be vital as part of the trade agreements, but how we actually orchestrate relationship managing these businesses and getting them into the opportunities which some of our other countries do better is going to be as vital and agree with the points made about the spending review and what happens with Horizon 2020 and other interventions that are going to be important to build upon and scale. We've got the ingredients, we need to scale them up.

Alison Williams

So hopefully there are things that we can learn from these other countries that are doing it better as well.

Irene Graham

We'll certainly provide some information on that Alison about some of the things we think could be easily replicated from a UK point of view.

Alison Williams

That would be brilliant thank you. You touched there and I know we've talked about it before about the smaller companies and kind of early stage businesses, to go to the other end of the scale for my next question I want to get your view on how attractive the UK is now post-Brexit to the big science, so the big science research and particularly I'm interested in data science and AI and whether leaving the single market has changed our attractiveness and is there anything we can do to try and kind of attract big companies investing in the UK? So, maybe if we go to Irene first?

Irene Graham

I think look we've got, I think we have got a very attractive market and we're seeing more and more corporates actually investing in our scale up economy and Google with its investment in DeepMind and what's happened there is a prime example of that. We are seeing commitments to the UK and you've seen that in a variety of announcements made by our large corporates, we need to keep consistent regulation and consistently a strength in our

collaboration across the world and making it easy to do business here which is a fundamental element included in that is of course our institutional capital and our private sector entities that we have, such as the Stock Exchange and others, so how we bring that together is vitally important so I think there's a real impetus and we're seeing very heavy investment coming from overseas into the UK economy and we can certainly showcase where those investments are coming. So I think we're doing a good job there, what we need to make sure is at the same time in the UK we're building as I've said before that institutional capital coming into our UK companies so that they actually stay with their IP and building in the UK as much as they take the international opportunities, so there's a conundrum there, I think we're actually doing very well on inward investment and attracting corporates in and more and more family offices coming in, how do we also retain the IP here and make sure that delivers to our economy is going to be the other side of that Alison and the team here.

Alison Williams

Yeah, that's really interesting, there's a kind of multiple dimensions that we need to try and cover, I guess with different legislation and different approaches to attract people and retain them.

Irene Graham

Exactly that.

Alison Williams

Yeah, Naomi do you want to contribute to that question?

Naomi Weir

Thank you I think I'll kind of point back to some of my points earlier around regulation particularly in the digital space, that's equally relevant here to this question because that's the you know environment that these businesses operate in, so regulation around digital engagement and you know making sure that that's in place. You know the UK is in many ways an AI leader so it's no surprise that businesses want to come here, you know the UK is third in the world for investment, second by deal count and home to you know some of the world's most vibrant and exciting companies. So there's a really good story to tell on this but we can't rest on our laurels as other countries are also developing their strategies and investment alongside. So business really welcomes the sort of recent national data strategy and the upcoming national AI strategy to support and build on momentum, but to the previous points around coordination and join up, there's a lot that will be within the AI strategy that will be housed within DCMS that really needs to speak to the innovation strategy, really needs to speak to investment being made wider across the piece, but you know so I think that coordination and making sure that these things aren't happening disparately but actually are more than the sum of their parts is what we're going to need to keep playing in this space.

So I think that's probably the main thing and then ... yeah, that coordination so that we don't have a fragmented environment so then you know the UK is a small market in many ways and so we need to make it as easy as possible so that they don't play first elsewhere.

Alison Williams

Yeah, do you think that coordination is happening today between those different strategies or groups creating those strategies?

Naomi Weir

You know I think for example the national data strategy does try to be quite an ... you know it's very wide ranging in terms of as a strategy with various things coming out of it and I think you know as the innovation strategy was developed they were looking at the missions and technologies, that seems to have been, I'm not expecting too much on that because of the new council creator that Patrick Vallance will be overseeing that will be overseeing that will be looking at some of those missions in technology areas, I know Geeta and co at Innovate UK as they say they've got their business innovation strategy but that's done a lot of work thinking about where can the UK really lead, the CBI has got some views on that as well, but actually we need to rather than just constantly wondering what we're good at, actually make a play and really go for it and make sure we do that joining up those bits. So the DCMS can't be doing something on AI that actually UKRI would be really well placed to advise on or link up with some of the work they're doing, so making that join up across the different parts of Government, across the different kind of phases of business development and innovation development would be really important.

Alison Williams

Great thank you, Geeta do you want to add anything?

Geeta Nathan

Yes just two points, I think just on that coordination and making sure that all of the different actors in the innovation ecosystem are working towards the same goals, I think one of the changes that we have with regard business innovation strategy is that we have worked with our sort of key partners within the innovation ecosystem really to make sure that we're all joined up and we've all sort of got those same outcomes that we want to achieve over the next five to ten years, so I think for us that is sort of a quite, it's been quite a growth path for us to sort of bring in key players, IPO, PVB, Scale Up Institute etc to come in and work with us on the strategy. In terms of thinking about also investment, I think one of also the challenges to think about is that yes, you know we are attracting now FDI and that's great, I think one of the things to also think about is that clearly there are clusters across the country which attract a lot more FDI than other areas and it's thinking about how do we make sure that the UK as part of its levelling up agenda is also attracting this investment more widely and not just in the golden triangle and other areas such as Manchester, and I think it's about thinking about the skills and the infrastructure within those regions to sort of attract that investment, so it's a longer term goal but it's also about you know within the universities more wider than the golden triangle and other key areas is thinking about what skills and what investment needs to go into research and skills and in evidence to attract FDI from global businesses to be based in the UK and have a much more balanced approach to where businesses locate, and for me the other challenge is that yes we're attracting FDI if we don't have the talent even in these key areas where you know price for talent gets pushed up really high which could make it potentially less attractive, so there's a real for my side and Innovate to make sure

we've got that talent in place, both in terms of research and development but also in commercialisation. You need, you know you need both, you can't just have lots of great research and not have the commercialisation of that research. So it's really thinking about how do we use this to actually enable the UK to achieve its levelling up agenda as well.

Alison Williams

Yeah and those two groups they're very different mindsets and skillsets and experience, so yeah agree we need to kind of tackle both. Thank you all, that was really interesting, thank you. I'll hand back to Chair.

Geoff Mackey

Alison, thank you very much. I'll, if I may, I'll take the chance of the Chair of asking one more question and fitting one more in please. The wider narrative is often of a UK Government on innovation that makes bold commitments that aren't really delivered, I just wonder would you like to express any confidence measures that things will get better going forward? Could we just, could we try Irene first please?

Irene Graham

Thank you very much, look I think there's ... I've said before we've got the ingredients in this country, what we have to do is continue to build on them, not create new initiatives but build on them, so firstly deliver what's committed to already, whether it be on the R&D expenditure, the productive finance working work that's going on, the patient capital and listing reviews, the innovation strategy, all of those things need to be delivered on and at pace. Secondly, we need to scale up for the long term, so we have got UKRI, Innovate UK, British Business Bank, these are all really important agencies, we need to scale them up as we go into this comprehensive spending review and for the long term. They are actually doing a good job, they're very recognised by the business community but we need to be at scale compared to our counterparts overseas, and then we need to connect up as well and I've made that point, how do we connect the research and academic through UKRI and Innovate UK more directly into our scale up economy and we need to focus in on the scale up economy in some of the industries that are going to make the future jobs of tomorrow for the country. So those are some levers that I think are going to be important, deliver, scale up for the long term those initiatives that are working and keep very focused on that scale up agenda as well.

Geoff Mackey

Thank you. Geeta?

Geeta Nathan

Yeah, so I think in terms of confidence it is having that longevity in terms of policy and delivering through as Irene said that we don't switch policies half way through because the political agenda as changed, I think there's got to be a real long term commitment, otherwise we will never see impact. I also think just looking at the innovation strategy that BEIS is going to publish this afternoon is you know the way they have worked collaboratively on that

has been I think a really good example of showing that there is now much more coordination between Government departments and that's going to be critical because innovation isn't about one Government department, it is about a coordinated effort and I think that has shown they have reached out to such wide number of different Government departments as well as think tanks etc, universities, really to bring in the different perspectives so that there really is a balanced approach to this. I think ARIA again, you know there was a commitment to this and I think now they're starting to deliver, so there is this sense that innovation, research, etc now taking a much more higher agenda within Government policy, but it is going to be about the commitment to making sure policy aligns to the speed at what's needed in terms of regulation standards but also as Irene said the funding, that it has to be consistent, it cannot be stop-start-stop-start and spending review clearly we're all in the midst of it, is going to be critical to make sure that the programmes that are in place are continued and build up on. So for me I think we've seen improvement in coordination, we're seeing it higher up the agenda and it's now really about making sure that there's the public funding behind it to provide that, to provide the building blocks and also I think learning from Covid, like we've got such great examples to learn from, both from businesses, how they've adjusted, but also from public policy, how it had to adapt, how it had to be agile and move quickly and to really bring those lessons learned into how we move forward, so that if we have another pandemic, if we have another crisis, we're in a good place to tackle it, I think for me that's going to be critical.

Geoff Mackey

Thank you very much Geeta, I'll shy away from any attempt to ask you questions about what's going to be published at two o'clock. Naomi would you just like to complete the set please?

Naomi Weir

Sure, I mean pair your question, on one hand the signals are good, at the same time there are warning lights flashing and we've been here before, we've had targets to grow R&D investment that we've not delivered on, so I think that's where the question is coming from. But you know the spending review will really be the litmus test on this one, not that it's all about spending as we've discussed, there are important levers that collectively need to be pushing in the same direction for success, you know from regulations, procurement, long term strategic direction and intent, all of those matter. But for business innovation is a source of competitive advantage that requires strategic long term investment and they can do it here or they can do it elsewhere and the UK has got a lot going for it but it will have to take ambitions to be ... you know it would be hard to take the ambitions to be a global science super power seriously you know or to be a global innovation hub, you know if the spending review doesn't set out a three year trajectory to reach its own state of commitment of 22 billion by 24/25. When that was set out that is now the end of what would be a three year spending commitment, so if we've got what Government says what they're going to do on year three and we need to do at least one year, filling in the gap in the middle would provide a great deal of confidence for business, but not doing so would be the, I think that's why it's the litmus test because actually what that will do is really set the tone across the rest of Government on this being really taken seriously and an agenda that officials, that Ministers can really press ahead and need to press ahead with in their own departments and within their own spheres. But also that really strong signal to Government and to the watching world that Government can be taken seriously on this and the UK will be a great place to invest and grow your business in the years ahead. So I think that's what we need in

terms of confidence and you know remember that the public portion is aiming to leverage twice as much private investment and so you know that's the goal here, it's not that public investment is the goal but it's that confidence to enable business to invest alongside, where we will start seeing that transformative growth towards the innovation economy that I think we all want to see and know is possible.

Geoff Mackey

Naomi thank you very much, I've really enjoyed this session from all three of you, thank you very much. Can I be a little sharp to finish, could I ask for a very simple conclusion, would you like to give me two recommendations to better innovate and commercialise in the UK going forward please? Geeta.

Geeta Nathan

So, I think for me there's two areas, one is commercialisation, thinking about it from the academic perspective, what you require for commercialisation from a university academic perspective is quite different from what a business needs and I think there's a real recognition we need that within Government that you need to think about both, both have definitely different policy needs and that is something I would really like to see them build on. And the last one is we've talked about longevity of policy so I won't repeat that, for me the last one is culture, it's really thinking about how are we going to drive that entrepreneurial, innovative culture within the UK so we've got businesses and individuals wanting to take those risks and really drive their businesses forward and expand and grow.

Geoff Mackey

Thank you. Irene?

Irene Graham

I think I'll repeat what I've said before, deliver on what is already committed and you need to do that at scale and at longevity which means the relevant funding behind it, connect, collaborate and convene is a very important aspect of what Government can do to crowd in both the academic and the institutional capital that will be needed, but deliver to the commitments and scale up the interventions that are needed and there are the ingredients of BBB, British Business Bank, Innovate UK, UKRI in that regard, they're going to be vital for the future. We have the innovative companies, I just want to re-emphasise that, we have very innovative companies, they do want greater collaboration with Government, universities in this R&D space, it's always the area they're focusing on, so let's deliver to it and let's make sure we're scaling up the interventions that are working.

Geoff Mackey

Thank you Irene, and Naomi the last word.

Naomi Weir

Thank you, I'm going to go with money and join up, so on the money side not just the 22 billion as Irene said agreed but actually Government needs to shift the profile of spend towards funding more business innovation, university funding is really important for R&D, maintain that, grow business innovation investment, that's where we see the piling in of business investment alongside and it's also where we've got more strength out with for example the golden triangle making it a really strong lever for levelling up as well. The other one in terms of that coordination and join up, we have this new body that's being created by the Prime Minister that Patrick Vallance will be leading, in theory it's a potential mechanism for helping support some of that join up across Government on research and innovation, let's use it as that and really enable and also encourage and build in coordination on research and innovation to achieve shared aims of net zero, of levelling up, of driving an innovation economy that supports jobs and growth across the UK, and I think that coordination point so that all the levers are pointing in the right direction will help maximise the benefit from that additional investment.

Geoff Mackey

Thank you very much. Can I conclude by thanking the three of you for the information you've shared with us, can I also thank Professor Shearer West for chairing the first session and for her witnesses, it's been a riveting session and I think there are a number of topics and threads that will run on into the autumn as we continue. Can I just finish by thanking my fellow Commissioners, can I also say thanks to the Secretariat for the support and can I wish everyone and safe and healthy break over the next few weeks. Thank you very much.