

Business and Trade Committee

Oral evidence: Industrial Strategy, HC 727

Tuesday 22 April 2025

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Watch the meeting

Members present: Liam Byrne (Chair); Antonia Bance; John Cooper; Sarah Edwards; Alison Griffiths; Sonia Kumar; Charlie Maynard; Gregor Poynton; Mr Joshua Reynolds; Matt Western.

Energy, Security and Net Zero Committee member also present: Bill Esterson (Chair).

Questions 445 - 491

Witnesses

[I](#): Professor David Greenwood, Chief Executive Officer, Warwick Manufacturing Group; Brian Holliday, Managing Director, Digital Industries, Siemens plc; Stephen Phipson CBE, Chief Executive Officer, Make UK.

Examination of witnesses

Witnesses: Professor Greenwood, Brian Holliday and Stephen Phipson.

Q445 **Chair:** Welcome to today's session of the Business and Trade Select Committee as we pursue our inquiry into industrial strategy. In this session today, we are looking not only at industrial strategy but at the impact of events in America on UK manufacturing and UK automotive. Obviously, it is a fluid picture, but we are keen to get your take. Stephen, perhaps I could start with you. We know a bit about tariffs, but, from what we do know, what is your view on how tariffs are going to hit UK manufacturing?

Stephen Phipson: We are waiting for the full effect, but there are probably three areas that we worry about. One is the direct effect, particularly the 25% on automotive and steel, because that will have an effect on demand. There is a case to be made that some areas can probably stand a 25% tariff in terms of consumer prices, but others certainly cannot. There will be a direct effect there.

There is the indirect effect, particularly around the EU. A lot of our manufacturers are in the supply chain for EU businesses, which are then exporting final products to the US. Again, the effect of that in terms of volumes on UK manufacturing will depend on where the EU negotiations end up, so that is a grave concern.

The third thing is really about stability, Chair, to be honest with you. We do not know from one day to the next whether Trump is going to carry on, suspend or change. It makes planning your business and your investments extremely challenging.

Q446 **Chair:** What are your members doing? How are they coping with this? You said that some of your members could not necessarily deal with the 25% tariff. I do not want you to name the firms, but which sectors are really going to find it difficult to get through the next year with a 25% tariff?

Stephen Phipson: The 25% was on steel. These are not normal steel products. These are advanced products. These are speciality steel and speciality components. In a lot of cases, the customers cannot do without those. They are the single source for those items, so the consumer will end up paying the 25%. The exam question is, "If these tariffs persist for any length of time, will the process of doing that curtail demand as people re-source?"

In the automotive sector, different strategies are being employed. You will hear much more about that later on. Some of it is about sharing potential tariffs, but some of it means that the industry will need support to get through the period. You will probably hear a lot more about that later.

Q447 **Chair:** From your point of view, what scale of support is going to be



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needed to support the most vulnerable sectors? Give us a sense of the billions that are going to be needed.

Stephen Hipson: First of all, it is again very difficult to know exactly what the demand reduction will be as a result of tariffs. Particularly, that second-order effect with the EU could be quite substantial. At the moment, we export about £60 billion worth of products to the United States. The effect on European trade would be even greater if there was a demand reduction as a result of the restrictions.

More than anything else, we completely support the Government in trying to get to an economic deal. Some other manufacturers are putting in temporary contingency plans at the moment, hoping that in the next month or two we can get some sense and they do not have to do the next level, which will be, if there is a demand reduction, to scale back factory capacity and that sort of issue.

Q448 **Chair:** That sounds like people being laid off.

Stephen Hipson: That would be the end result of a dramatic reduction in volume. Yes, that is absolutely right.

Chair: The manufacturing sector in the UK will need to start laying people off if we do not get a tariff deal.

Stephen Hipson: Yes. It will absolutely have to, but there is a great deal of support, I can tell you, for the efforts that both Jonny Reynolds and the Chancellor are making to get this deal over the line. We need to get that done.

Q449 **Chair:** How quickly will jobs be lost if we do not get a tariff deal?

Stephen Hipson: There are two aspects to it. First, are we getting any further with the deal? How long is a piece of string? If you think of UK manufacturing, it is represented by 800 large companies and 250,000 SMEs. That is the structure of UK manufacturing. Many of those large companies have put contingencies in place in one form or another, which gives them two or three months of gap. That gives you an order of timescale before there would be a reduction in capacity planned. The SMEs are living hand to mouth. They want to know, day on day, whether adding 10% to their product is going to reduce the volume they are shipping to the United States. For them, it is a much more direct impact. The larger ones can put this off for a few months, but the smaller ones are going to see it now.

Q450 **Chair:** We could see job losses by the summer.

Stephen Hipson: If we do not get a deal, yes.

Q451 **Chair:** During covid and the financial crash, we put in place quite big packages of help quite quickly. When you look backwards to what we have done before, do you have a sense of the kind of scale that we might need to ready to support our manufacturers?



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Stephen Phipson: I do not have a direct answer to that. I know in certain large manufacturers you are talking about the effect being over £500 million of margin, if you are not careful, if it goes to the extreme of 25%. It is hard to tell until we know what the direct and indirect effects are going to be.

The other thing that we do not know is what Trump's reaction will be to any economic deal that we have with the United States and what he would ask for in return. Is that going to weigh on the other side of it? There is a lot of uncertainty at this point. That is precisely what manufacturers do not need at the moment.

Q452 **Chair:** Mr Holliday, what is your assessment of the impact that tariffs will have on your business?

Brian Holliday: I concur with Stephen that uncertainty is one of those factors that clearly we try to avoid. That is challenging for all businesses at the moment.

I represent the UK business for Siemens, which is one part of a €150 billion market cap global manufacturing company, here in the UK. We have 11 manufacturing sites with about 12,000 people across healthcare, rail, industry and energy sectors. The direct impact to us is reasonably limited. It is quite limited. With a global manufacturing base, we are largely not exporting directly from the UK to the US. In our current assessment, as a manufacturer—of course, we have a global conversation to have about this—from a UK perspective the impact is relatively limited.

I am much more concerned about the indirect impact on our customers. It is those companies right across the industrial spectrum that are using our technologies in designing products and processes, automating factories and using industrial data. The impact on demand from them will have a knock-on effect for those of us working in the innovation space.

Q453 **Chair:** The Government have gone out and asked industry whether we should be imposing retaliatory tariffs on the United States. What is your view about the wisdom of that?

Brian Holliday: As Siemens, we stand for free and fair trade. We would want to try to limit the protectionist interventions that could follow. In that sense, we aim to be as competitive as is reasonably possible and we genuinely believe that technology is part of the answer. If we can embrace technology in such a way as to create world-class products, we will have a customer base regardless of the countries in which we manufacture. Certainly, our preference would be to limit tariffs and non-tariff barriers to trade.

Q454 **Chair:** You do not favour retaliatory tariffs, by the sounds of it. Stephen, is that the view of most firms?

Stephen Phipson: It is, yes. From surveying tens of thousands of manufacturers, Chair, the view is that we are adopting the right approach



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right now, being calm, being measured, trying to negotiate an economic deal.

Q455 **Chair:** Professor Greenwood, do you have any observations about how tariffs are going to hit the businesses that you work with?

Professor Greenwood: It is going to be different for different businesses, of course, depending on their exposure to different international markets. Even within a single sector such as automotive, some manufacturers in the UK predominantly build for export to Europe and some have very profitable exports to the US at the moment. Even within a single sector, you are going to see some quite different responses.

Perhaps the only thing I will add to what Stephen and Brian have already said is the flip side of all of this. For things such as electric vehicle and battery manufacture, where we have a free-trade agreement with Europe at the moment, if we are able to negotiate a favourable trade deal with the US relative to what Europe is able to do, it would make the UK more attractive as a location for manufacturing investment.

Q456 **Chair:** It sounds like tariffs are going to hurt. We could have job losses by the summer. We do not yet know quite what scale of response is going to be needed, but, when it is needed, it is going to be quick, presumably. Retaliatory tariffs are probably not the right thing at this stage.

Professor Greenwood: No, they are not the right thing.

Q457 **Matt Western:** Stephen Phipson, can I pick up on the point that the Chair was making in terms of the SMEs? You were saying that for smaller businesses, which are much more hand-to-mouth, there will be a much more immediate impact. To what extent is DBT being agile enough in supporting those businesses?

Stephen Phipson: I spend quite a lot of time with DBT. It is a real challenge, to be honest with you. Even for us as the national manufacturing organisation, reaching 250,000 SMEs is a real challenge. It tends to be quite a small group that you engage with at the end of the day. Nowadays, place has become much more important. Someone can be a champion in their area and then show other businesses how they have coped. That seems to work quite well.

We have had a discussion recently with DBT about what other communication methods we can use to get to more of those SMEs.

Q458 **Matt Western:** So it is okay.

Stephen Phipson: It is okay, but we could always improve it.

Q459 **Matt Western:** My next question is looking at the opportunities for advanced manufacturing over the next decade. Which sectors offer the greatest potential? Professor Greenwood, perhaps you could start on



that.

Professor Greenwood: The first thing I will say is that some of the areas where we see the greatest potential are also areas where the greatest changes are taking place. For instance, automotive, aerospace, defence and energy are all large-scale industries with big installed bases that can be mobilised relatively quickly compared with setting up something that we do not have at all. All of them are going through changes of one sort or another, whether it is a technology change, a regulatory change or a decarbonisation and circular economy challenge. Those sectors are certainly big enough to be able to move the dial quickly.

Stephen Phipson: There are a number of really important areas where we have been feeding into the work on industrial strategy to make sure there is a high focus on them. The first is around all the green technologies that we are innovating on in this country. We are world leaders in green innovation there. Scaling up and being able to deploy those green technologies is really important for the future. It is already creating hundreds of thousands of new jobs in our sector. We like that.

We are world leaders in advanced materials. What more can we do on the advanced materials side? How do we accelerate that leadership and produce products with those advanced materials? That is a core part of where we need to be.

Pharmaceuticals and biotech research is another area where some attention is needed to make sure we have a really thriving biotech sector. Again, we would like to see some adjustments in the industrial strategy to enable that to happen.

Q460 **Matt Western:** Could you unpack that?

Stephen Phipson: Sure, yes. We have a long process for drug approvals. It is expensive; it deters innovation. People will go elsewhere, if we are not careful. Can we improve that? Can we reduce the bureaucracy? Can we reduce the red tape? Can we really capitalise on the innovation that we have and try to make sure that it is world class?

Aerospace is vital. It is linked to advanced materials in many respects. We have a great position in commercial aerospace at the moment. We are the largest provider of componentry for the commercial aerospace sector. There are whole new generations of equipment being developed there.

On automotive, again, one of the specialities of this country is luxury automotive, if you look at where we are. We are pushing that forward. All the Formula 1 teams are here. We have great heritage in that.

How do we create a strategy around some of those really interesting high-growth sectors, all of which come under the advanced



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manufacturing banner? That is the challenge of the industrial strategy for the next 10 years.

- Q461 **Matt Western:** Are you encouraged by what you have heard so far? As you say, over the decades we have been great with innovation and great with original thinking, whether that is materials or new products such as lithium-ion batteries, but we never see it through. Stephen, you have been around for a little while.

Stephen Phipson: I have been around for a little while. You are right. We have seen a few of these.

Matt Western: Are you excited or are you enthused by how well that is coming together now?

Stephen Phipson: My clear position on this is that there is a lot of good thinking going on. There are two points that will make this work or not work. One of them is joined-up Government. At the moment, the two biggest challenges in UK manufacturing are energy costs and skills. There is a lack of skills and our energy costs are the highest in the world for industrial energy. That deters inward investment. That means we cannot build factories and staff them up.

We need to see a clear 10-year plan that has the priorities of these sectors in it. DfE needs to have a skills plan that populates the right skills for them. The Treasury needs to have an incentive programme for investments in those areas. At the moment, we do not have that. The question mark in my mind is whether we are going to see that in the industrial strategy. That will be really important.

- Q462 **Chair:** I just want to crystallise this, Stephen, because this is a really important point. Right now, you are saying that the industrial energy plan and the skills plan are not quite visible.

Stephen Phipson: Some of them are complete failures. If you look at the DfE and where we are with vocational skills, since the levy was introduced in 2016 our apprentice starts in manufacturing are down 42%. That is a disaster. Many companies are trying to upskill, reskill and put in service technicians to service robots on new robotic lines. We do not have the people.

We get involved in many FDI opportunities. One of the questions is, "Why should we invest here?" We have the highest energy costs in Europe and we cannot get the people to man the factories. We need plans that push these things together. We need to put these issues into one clear plan going forward.

Chair: I will just bring in Bill Esterson on that point.

- Q463 **Bill Esterson:** Thanks very much, Chair. Good afternoon, panel. Stephen Phipson, I know you feel we should decouple our electricity prices from the price of gas. You have said that a number of times in public. In



addition to that, do you see that reducing our reliance on gas more widely and increasing the development of homegrown clean electricity generation would help industry as a whole?

Stephen Hipson: I absolutely do. If you look at the challenge for industry, only 20% of UK industry is electrified at the moment. That is an astonishing statistic. A lot of it is gas-fired space heating—you name it—and all sorts of things.

This is linked to digital adoption. We have a digital adoption programme called Made Smarter. Around 5,000 SMEs have gone through it. One of the big benefits of digitising factories is that you end up with around about a 45% energy efficiency improvement. It is a combination of energy efficiency and electrification, which must come from renewable sources. That has to be a good way forward in terms of the opportunities that we have.

Q464 **Bill Esterson:** David Greenwood, I can see you nodding. Would you like to add to that?

Professor Greenwood: One of the biggest challenges for decarbonisation, particularly for taking gas out of the industrial context, is heat. Gas is by far the most economic and sometimes the only technically possible way at the moment to generate the kind of heat that certain industrial processes need. We do not necessarily yet have a clean alternative to it. In many cases, it is not simply a question of switching the fuel from gas to electricity. If we move from gas heating to electric heating, we are often changing to something such as infrared processes or laser-drying processes, so a totally different industrial process.

The companies that are decarbonising will need some support so that they can develop those new processes, validate them and make sure the product is the same quality at the end of it when the process has changed.

Q465 **Bill Esterson:** Just to be clear, are you advocating that approach?

Professor Greenwood: I am.

Brian Holliday: I would support the comment about digitalisation and the interventions that we have with Made Smarter making a difference. We must electrify if we are to decarbonise. It is critical. We have challenges around prices and grid connections as well, but many of the technologies exist today.

Digitalisation is a topic that is traditionally linked with productivity, but fundamentally it is linked with decarbonising industry as well. We could be a bit more joined up in our approach to using technology to drive both in industry. It is necessary if we are going to meet our circularity and climate change objectives as well. These are core and common technologies available today that can already make a big difference in industrial processes.



Q466 **Bill Esterson:** Do those calling for a reversal of net zero policies have a point or not?

Brian Holliday: We absolutely need to recognise the need for interventions and technology is part of the answer. In industry, which is roughly 25% of carbon emissions, we have work to do. It is not happening at the sort of pace and scale that it perhaps ought to without a level of government intervention and focus as part of an industrial strategy.

Stephen Phipson: We need to take a pragmatic approach. Yes, the overall objective is the right one, but we need to make sure it is practical to implement. The zero emission vehicle mandate is probably the best example of that. We have had to change the parameters there. We should be clear about this. Without rushing into it, let us make sure we have something that is deliverable in the right timescales.

Professor Greenwood: I would echo that. The end destination is clear. The question is the pace at which we can achieve it, given the ability to move industry across and given the speed at which we can do things such as create the electricity connections and generation capacity that we need to do it.

Q467 **Alison Griffiths:** I just wanted to follow up on the point you made, Professor Greenwood, about heat processes moving from gas-based production to electricity. This is also a question to Brian Holliday. Are you confident that we can create those new technologies that will enable that? At the moment, from what you have both been saying, we do not know what those technologies are, but we are insisting on moving to electrification for decarbonisation.

Professor Greenwood: Some of them we do not have answers for yet. In particular, if we look at high-temperature processes at 500 or 600 degrees, it is very difficult. Things such as heat pumps simply do not go that hot. We need R&D. We need technology to look at how we are going to get to those points.

Others we could do. Lower-grade heat processes, such as baking processes, which are typically around 100 degrees or 200 degrees, could be decarbonised. That is a question of cost and time.

Q468 **Alison Griffiths:** Just to answer the specific question, let us stick with high-heat processes. What degree of confidence do you have that we will get to those processes in the next five years?

Professor Greenwood: We cannot see the answer in front of us immediately today. It takes time for research and development to deliver; then it needs to scale up; and then it needs to be implemented. If we are talking about a five-to-seven-year timeline, I would be concerned. If we are talking about a longer timeline, I think we can get there.



Alison Griffiths: Brian Holliday, let me ask you the same question.

Brian Holliday: I support Dave's comments. There are not immediate or easy answers to this, but there is definitely something in building the foundations for this industrial strategy with net zero and electrification as part of that. Specifically, that means having the technicians and the graduates that we need in the sector and having a joined-up skills and innovation landscape. We need Made Smarter to be making interventions with smaller firms; we need our catapults to make mid-technology readiness-level interventions; and we need to exploit the excellence we have in research and development.

The industrial strategy should help to bring together some of these elements that will help us focus on the long-term mission of net zero as well as economic growth. We need to build the foundations because we need more people contributing to industry in a way that recognises that we can exploit the technologies that are available to us. We do not have indigenous technology firms in this space, but we do have excellent R&D capability. Our opportunity is to exploit technologies much better than those around us to get to the answers earlier. This is the role of the catapults in particular.

Alison Griffiths: It is the link between skills and technology.

Q469 **Mr Reynolds:** Stephen, right at the beginning you talked about certainty and not wanting to change the goalposts when it comes to policy and direction. You have also spoken quite positively about changing the EV mandate. Where do we need to draw that line in terms of giving long-term certainty to business but changing policies when they need to be changed?

Stephen Phipson: If you look at the average investment cycle in manufacturing, it moves between seven and 30 years. You make those decisions, and then you are into a seven-to-30-year investment cycle in most manufacturing investments, particularly in those larger companies. If you do not have policy stability and your corporate headquarters is in Munich or Singapore, they do not understand the nuances of that. They are looking at how certain the investment environment is seven-plus years out. If it looks uncertain or if the track record is that you are chopping and changing all the time, they will put it somewhere where it is more stable.

We thought that was America, but it is not America any more. Maybe we are in a better place now than we were a couple of months ago, but that tends to be the way people look at it in terms of those cycles.

Q470 **Mr Reynolds:** Moving on slightly, we have mentioned automotive and aerospace manufacturing. They are all sectors that the UK are really good at manufacturing. How do we maximise demand for those products in the UK? What more could the Government do to maximise that demand?



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Stephen Phipson: The big issue is public procurement, which has a substantial effect on what we manufacture and we do not manufacture here. You have seen the debate in the media about using UK steel on British infrastructure projects and why we keep outsourcing it to other countries to the demise of our own industry. We need to be cleverer about public procurement.

It does not need to be a subsidy. Industry is not looking for a subsidy. It is looking for a preference for using UK products because it is economically beneficial. That is what other countries have been doing. Certainly, even those within the EU tend to do that sort of thing. We should be doing something similar and using the large lever of public procurement to help.

Q471 **Mr Reynolds:** You mentioned EU countries. Should we be moving more towards a French model of public procurements?

Stephen Phipson: I would never advocate moving towards a French model. I love the French, but that is probably not the right model. We should be creating our own model that is sensible and pragmatic, using our resources wisely and making sure we are looking after our own economic interests when we are looking at procurement, for example.

Q472 **Mr Reynolds:** Is that supported across the panel?

Brian Holliday: Equally, we have to make sure that we are the best country in which to start and scale a business and to build the products that are wanted by the global market.

The answers are in the technologies, some of which we have in common. Red Bull Racing's Formula 1 cars use similar digital twinning technologies to those that you might be surprised to hear we are using in the Pringles production line at Kellanova; that is a very highly desired product as well, of course. Think of advanced manufacturing as a key to unlocking the capability, design and make-ability that would make the UK attractive. We have to design world-class products and we have to use tech to do that better.

Professor Greenwood: We have talked about public procurement as something that drives domestic consumption. We have talked about trade deals as something that could drive export consumption. The other piece that I would put behind it, which really drives it, is having the right products made competitively and productively in the UK. That is about energy, skills and integrated supply chains. It is about doing the job well. If you build the right product at the right price, you can build demand globally.

Q473 **Antonia Bance:** We have talked about energy. We have touched on the problem with skills. I wanted to hear a little bit more about what you think the solutions in the skills landscape are. I will start with Stephen, please.



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Stephen Phipson: There are a number of solutions. We recently ran an Industrial Strategy Skills Commission, where we talked about providing some of those answers to the skills problem.

For many manufacturers, fixing the apprenticeship levy system is one of them. We have seen the biggest decline in apprentice starts since the levy was introduced in 2016. You may ask, "Why are employers not doing more?" If you look back at that structure of 800 large ones and 250,000 SMEs, we find that the 800 large ones are investing like crazy in skills because the system is not working. They create their own training academies. If you go to any of the large companies, you will find that they have set up their own training academies up to provide an apprenticeship programme for their own use.

The challenge is those 250,000 SMEs. We have not increased funding on apprenticeships and we have largely ignored what we are doing on the basic level of technician apprenticeship. Most FE colleges are not offering those courses any more. You cannot take on an apprentice if you are an SME in your local area. That has meant we have seen this dramatic decline.

The effect of this is that currently we have close to 60,000 long-term vacancies in manufacturing. Most of them, almost all of them, are at technician level. They are vocational skills. These are the service technicians that fix robots on the shop floor. They are toolmakers; they are welders. These are all absolutely fundamental skills. No matter how much AI and everything else you have, you still need someone to fix the robot on the shop floor, as one chief exec put it to me last week, in no uncertain terms, as to why the Government are not doing anything about this problem.

Q474 **Chair:** Some reforms to the apprenticeship levy have been announced.

Stephen Phipson: They have, but they are nowhere near enough. We put the case very clearly to the DfE in terms of what needs to happen.

Q475 **Chair:** Where did it fall short?

Stephen Phipson: It fell short on the funding bands, basically. Let me give you an example. Technician level 3 is the starting level for most apprenticeships in the manufacturing sector. The Government's levy funding is about £27,000 for the course. The cost of delivery for most FE colleges and private providers is now, on average, £35,000. That figure of £27,000 was set in 2016. What has happened since then in terms of the cost of living, of tutors and everything else? That is why these people are not providing those courses any more.

Q476 **Antonia Bance:** Does anyone else on the panel want to come in on skills? In the changes to the growth levy, perhaps there is some way that some of the funding could be reprofiled from the higher courses to the lower and medium courses. Certainly, in my constituency the need is for the 3s and 4s, not 6s and 7s.



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Stephen Phipson: Yes, exactly. I completely agree with that. There is also an underspend of about £800 million from the levy collection. Can we use that to get some of these level 3s and level 4s moving? That would be very good.

Brian Holliday: I would support Stephen's comments. I had the opportunity to contribute to the Industrial Strategy Skills Commission as well. It is a worthwhile report to read on the topic. Siemens employs over 600 apprentices and graduates in the UK. As a former apprentice, I would like to advocate to this Select Committee the need for more of us. In industry, it is critical.

I support the view about the importance of long-term vacancies. There is an interesting thing to be careful of here. As a branded company, we do not have a problem recruiting as many apprentices as we want. The issue is the longer tail of manufacturing firms. We have an image issue; we have parity of esteem issues. These have been long-standing and well documented, unfortunately.

I really would want to support and endorse the work of Skills England as a body. I just wonder whether we are being fast enough and joining that up enough with the industrial strategy.

Chair: You are allowed to say that we are not.

Brian Holliday: What has been done so far to unlock the need for us to review the supply and demand of skills is critical. Yes, we need to put more money into training engineers and technicians. It costs more. The growth and skills levy needs a reform in that sense.

We have to do more on the attractiveness of apprenticeships as well. Careers advice needs to be addressed in schools. It is not joined up. We have run virtual work experience. We have now reached over 10,000 students from very diverse backgrounds. A much higher proportion of girls participated than the 17% who are represented in the sector as a whole. There is more that we can do, but there needs to be a joined-up and centralised approach to careers advice.

I wish that Skills England could sit, with its remit for skills, directly alongside these other topics of innovation, energy, energy prices and access to finance as critical enablers to deriving growth from the industrial strategy.

Q477 **Chair:** It is not quite in that position yet.

Brian Holliday: All these threads need to come together in a way that feels much more joined up at a whole-of-government level, yes.

Q478 **Antonia Bance:** David, you must be pleased that Skills England is coming to Coventry. It is nice and close for you to be able to pop round and tell them what is what.



Professor Greenwood: It will certainly help. I would just echo the comments of the other panellists. It is really important we get connectivity between sixth forms, further education, higher education and private providers when it comes to skills. I would definitely echo that, while we are not doing terribly on STEM graduates, we need to get better diversity within that. Female and BAME people are still underrepresented among STEM graduates, but the biggest gaps are shop floor and mid-career.

The one thing I will add to what was said by the colleagues to my left is that mid-career reskilling and retraining is really important. We have people in management or middle management positions in companies where the technology is changing dramatically. They need to be able to keep pace as well as those who are coming into the business at the bottom end.

Q479 **Antonia Bance:** On that point about people who are mid-career, by definition they have a car loan, a mortgage and kids. How do we make it financially possible for them to take a break to retrain? I would appreciate your thoughts on that point.

Professor Greenwood: There are two aspects to it. There is the demand side and the supply side. First, we need to make sure there are the mechanisms available for them to engage in. Typically, you are looking at things they can do over short courses. They will not be taking a year out of their career; they will be spending a week or two weeks upskilling, going back into the workplace and then being supported when they use that knowledge for the first time for real.

Secondly, we cannot just think about working with the providers to make sure those mechanisms are available. How do we make sure employers and employees are incentivised to take that step? At the moment, many industries are running as skinny as they possibly can in terms of workforce. They are not in a position to take large numbers of people out for retraining. What could we do that might free that up?

The other challenge that you have is that some of the skills we need to train for are outside of the companies that exist today. It is unreasonable to expect a company to take its employees and train them for a job somewhere else. How do we give employees the agency to take their future career into the skills development they want for their next role?

Q480 **Chair:** What is the answer to that?

Professor Greenwood: The lifelong learning entitlement seems like a good idea. That gives people their own budget to access skills and training mid-career. There is an awful lot that could be done within companies to incentivise the release of people midway through. It could be something along the lines of an R&D tax credit, not for research and development, but for reskilling and, I would also say, adoption of technology, which we have not talked about a lot.



Q481 Sarah Edwards: I just want to come in on some of the points that you have made. In particular, I have heard about this issue around the deficit in the amount of funding available for apprenticeships. The Road Haulage Association has mechanics who are helping to train people to work on electric rigs, but there is a deficit. Again, we are not going to have those people coming through. It also said that you then lose places to do the training because they drop the courses.

I wonder whether you could speak to that problem. Are we creating training deserts? We do not have the places and, therefore, we do not have people going into those options because the places are not available when they were before. Could you speak a little bit to some of your concerns around that? I know you have just outlined some of those areas.

Stephen Hipson: I completely agree. We see that around the country. Certain areas are finding it more and more difficult because there is less demand. The problem could even be the other way around, in that the local college does not want to run those courses because it is uneconomical. It is almost like a self-defeating circle. That is the problem with that. It is a real problem.

The answer to it is to fix the funding and get it right. They know the facts. IfATE did quite a lot of work on this. It was very clear that, yes, it does need to be raised to these levels. It was in existence before Skills England, but there was a ministerial cap at £27,000 and that is it. You do not get much traction.

Q482 Antonia Bance: There are other issues that the industrial strategy has to get right. We have spoken about skills and energy costs. I would be interested in your thoughts on land and access to finance. Those are the two other issues that are coming out in the responses to the industrial strategy. Brian, shall I start with you this time?

Brian Holliday: I co-chair the Made Smarter Commission with Minister Jones. One of the sub-committees that I have been co-chairing with Dave Atkinson, who heads up manufacturing at Lloyds, is on access to finance. We have spoken to a range of companies that are trying to start up, scale up and find capital for plant and equipment. That seems to be much harder than it ought to be in all cases.

There is a range of issues. Some of that is about firms running out of investment support from the Government here in the UK when investment support was apparently still available even from near neighbours such as France.

We recognise that scaling up is a challenge as well. We know there are already interventions in place with the British Business Bank and the restructuring of UK pension funds to unlock investment in industry. It seems to me there is a common story of firms being unable to gain palatable debt-based finance in order to invest. If you put that against a backdrop of either indecently short competition windows, if there is



money available, that might not align with the company strategy or the difficulty of accessing finance, the net result is an underinvestment in the technologies that we know correlate to overall productivity. That flatlined in 2008. We have not solved that problem. The Made Smarter review identified this correlation. Industry seems somehow more difficult to invest in than infrastructure.

We have to be much clearer about not just the role of the British Business Bank but the signposting of the support schemes to help firms get access to critical funds, if we are to invest and grow.

Q483 Chair: Brian, is the British Business Bank in the right place on this stuff?

Brian Holliday: It is early. We know its role and remit. The issue that we found with the firms that we spoke to was they were not necessarily aware of it or its remit yet. We have had conversations in the past with former members of the Department for Business and Trade about producing a manufacturing prospectus, having some way of consolidating and signposting better all the support schemes that are out there from a Made Smarter technology intervention to a catapult, a finance offer and so on.

We are doing a lot of things, but, particularly when you get into skills, these things become very fragmented. For the SME community in particular, it becomes very difficult to see where you go for help. I would strongly advocate for policy instruments that are simple and always on. Two examples would be R&D tax credits and the patent box. Those are things that firms have understood in the long term. We need to bake them into schemes that are better signposted than the ones that we have traditionally relied on.

Q484 Sarah Edwards: My question links quite neatly into some of what we have just discussed. Do you have some thoughts on the current funding that the Government have provided? Over the course of the Parliament, £2 billion is allocated for automotive, £975 million for the aerospace sector and £520 million for life sciences manufacturing. What do you think about these sums and figures? Perhaps I could start with Professor David Greenwood.

Professor Greenwood: First, if you look at those figures in direct comparison with places such as the US and Germany, they are smaller. It is as simple as that. However, we have the opportunity to make the most out of them with greater connectivity across the R&D landscape. These are predominantly R&D funds that you are talking about. Some of this is to support industrialisation. We have a fantastic R&D capability in the UK, but it tends to be a little bit fragmented.

We have an opportunity with the industrial strategy to follow the model that we had in previous industrial strategy interventions, such as the Faraday battery challenge, where we have connected what happens in academia with what happens in innovation, industrialisation and then



later commercialisation and regulation. That makes the money go further. Certainly, when we talk to the visitors who come to see us from Germany, the US and places such as that, they are quite envious of the mechanisms that we have to deliver that connectivity. Would more be welcome? Absolutely, yes.

Where is the gap? These are predominantly R&D-like mechanisms with some industrialisation on the other side. The biggest gap that we see at the moment on the finance side is at the private equity stage of a business's development. In the UK, we are okay at getting angel investment funding. We can usually get collaborative research and development-type funding to do the first stages. It is about the point at which a manufacturing company needs to raise typically between about £10 million and £50 million to put a pilot facility in place to be able to deliver the first orders to customers. That is an incredibly difficult raise in the UK at the moment. The risk profile does not suit the private equity investors that we have in the UK today. It is something that Germany and the US have a stronger appetite for.

Brian Holliday: A critical role that Government could consider would be as a guarantor. If we genuinely believe in the benefit of plant and equipment investment in digital technology, there is a role there, particularly for firms that do not necessarily sit in those key sectors.

To answer your question, we have these world-class sectors. We have world-class capabilities in auto and aero. We have new imperatives in defence that will have a crossover in terms of the skills needed for us to step up.

I will not comment on the totals invested. I would just draw your attention to the need for us to invest in the horizontals as well. In that sense, it is about building the foundations for sectors where we can be world class. Take grassroots sport, for example. It is about having a much wider base where you build talent that can progress. That is just as important in manufacturing.

In Made Smarter, there are financial criticalities for Government. We understand this. There is a potential £100 million that has been identified for the very long tail of small firms that make up the manufacturing sector. We are trying—by “we” I mean those of us in the firms that are working together with the commission and Minister Jones—to roll this out across the UK and reach as many firms as we can with a technology intervention or a leadership intervention to help them think about the benefits of technology. That will develop skills. It will develop gateways to catapult-level innovation activities.

If anything, we need to think much more about investing, with certainty, in the horizontal and technology topics as well.



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Stephen Phipson: The R&D funds that you are talking about are welcome. It is good to see R&D money being spent in those sectors. It is relatively small, but it is good.

It is a very small contribution to what is an incredibly big problem in this country. I have spent 35 years-plus in manufacturing. We have always had the same problem of scaling up our innovation. We just cannot do it. This is the place where everything is invented. We work very closely with Innovate UK and all the start-ups that are coming out of there. So many start-ups are funded partly by Government to get to that innovation stage but ultimately end up in US or European ownership because we have a market failure of scaling them up. We still have not found the solution to that. If we could find a solution to that, which I have seen time and time again with various Governments, we would make a massive difference.

Last year, we were in the US talking to our American counterparts and asking American companies what they thought about the UK. Their view was, "The UK is fabulous. You invent everything in the UK, but you have no money, so we scale it up over in the United States". We have to try to break that market failure, whether that be the Government taking a radical view and taking equity stakes in these start-ups or something different. Fixing around the edges with small pots of R&D money is not the answer.

Q485 **Sarah Edwards:** Is there enough of a risk appetite in this country?

Stephen Phipson: We have all sorts of problems around the Bank of England's rules about investing in SMEs and start-ups. We have other investments in financial services that have a much quicker payback than long-term manufacturing investments. There is a whole raft of reasons.

Q486 **Chair:** On this point, Stephen, the Committee would benefit, if you could bear it, from a note on that full list of barriers. This is something that we are so concerned about.

Stephen Phipson: Okay, I will do.

Chair: I appreciate that.

Q487 **Matt Western:** On that point, Professor Greenwood was talking about the pilot manufacturing stage between £10 million and £50 million. That was where the big gap in funding was. My question was going to be around what Stephen Phipson was coming on to. What happens in Germany or Japan that is so different? We have just come back from Japan. We have learned a huge amount. These countries are looking much more long term. What is it about our banking sector? We have a huge financial sector in this country. Where is the gap?

Professor Greenwood: If I can comment on that, the typical gap is in private equity. It is the first steps of private equity.



Q488 **Matt Western:** They are putting it all into nurseries and things like that.

Professor Greenwood: Typically, you are stepping out of VC land and into private equity. The challenge is that the investment community in the UK is used to making tech investments, where the money is put in linearly. If something is going well, you can choose to put more in. You can turn it around quite quickly. You see a return on investment within a three-to-five-year period. A lot of them fall by the wayside so you can spread your bet. As long as 10% of them come through, you make your return. The challenge is that manufacturing needs a very different shape of investment. You have a big capital drawdown in the first year, and you only start to see the returns thereafter. It is quite a different risk profile to the one that the investment community we have in the UK is used to seeing.

When we look at US investors, we tend to find that their fund managers are ex-entrepreneurs who have exited. They tend to have a slightly different risk appetite to those we meet in the UK, who are typically ex-consultancy or ex-finance community.

Q489 **Gregor Poynton:** In some of your answers, we have touched on some of the institutions that are there to support your sectors and more broadly, such as the British Business Bank, the Industrial Strategy Advisory Council and so on. I would just be interested to get your perspective on whether we have the right set of institutions to support and maximise growth in the manufacturing sector. If not, what would you like to see in the next iteration of the industrial strategy to support you? I will start with Stephen.

Stephen Phipson: As ever, the labels are probably right. It is about focus, resources and the scope of their activity. DBT does a very good job. We have to do more to communicate to those 250,000 SMEs in manufacturing. DBT is coming up with the industrial strategy. The sector's expectations of that are very high at the moment. We are looking forward to a comprehensive industrial strategy document from DBT.

Chair: So are we.

Stephen Phipson: That is an important point to make. We used to do much more interventionist things. Years ago, we had this thing called MAS, the Manufacturing Advisory Service. That was a great service by Government. It was massively appreciated by the SME community. They still have it in Scotland. We stopped it in England. There were about 1,200 advisers knocking on doors in industrial parks every day of the week.

Q490 **Chair:** Should we bring it back?

Stephen Phipson: We should bring MAS back. That would be my recommendation. We could rename it with the other initiatives that we have.



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Brian Holliday: Can I challenge that? We have got it. It is called Made Smarter.

Stephen Phipson: We do not have 1,200 consultants.

Brian Holliday: No, but we need to invest in it at that sort of level. We are agreeing on that.

Stephen Phipson: We are in violent agreement, yes.

Brian Holliday: We have the right institutions, but I wonder whether we could join up the conversations even more as part of a whole-of-government approach. It seems to me that we have very good intent, no question. We are having the right conversation about the 10-year strategy that business has been calling out for, which is less impacted by political cycles, to the extent it can be. It strikes me that we are having quite different conversations with DSIT, DBT, DfE, DESNZ and the Treasury. I wonder whether, through the institutions that we have and the Industrial Strategy Advisory Council, there could be a way of organising conversations with the firms and contributors in the UK to be joined up a bit more.

On Made Smarter in particular, there is something about that grassroots connection that gets us going. It is the curious and innovation-hungry small firms with a hand-to-mouth existence that do not necessarily appreciate the benefits of technology, do not necessarily have the skills and so on. We have to do more to bolster the long tail of firms. We could call it a digital manufacturing advisory service.

Professor Greenwood: I would agree. For the most part, we have the institutions that we need. What I would really like to see from the industry strategy is connectivity around the challenges. In particular, we need to bring together DBT, DSIT, DESNZ and DfE around how we take on the challenges so we can have a common policy goal on each of those.

Q491 **Chair:** This is what we noticed in Japan. A lot of the industrial policy is framed around fixing grand challenges rather than some very broad missions. Is that a better approach?

Professor Greenwood: I think it is. If you look at the field that I am in, for instance, Innovate UK is housed within DSIT. I run a catapult centre, which is an Innovate UK mechanism. The fact it is linked into DSIT means it naturally falls into some of the DSIT technology push, which is around quantum, life sciences and bioengineering. Please do not get me wrong. Those are fantastic technologies that the UK will do fantastically at, but there is a bit of a disconnect between that and the technology pull that we get from our industry customers, who align themselves more with the Department for Business and Trade. We have to find a way of getting that continuum to work nicely.

I would just like to echo the point around SMEs. The mechanisms that we talk about with industrial strategy tend to be guided around the larger



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companies and the larger sectors. In the UK, SMEs make up 57% of our manufacturing workforce and 35% of our manufacturing turnover. They are much more difficult to reach and much more difficult to support, but they are incredibly important. In those cases, sometimes it is not about innovation; sometimes it is about adoption. It is just about getting companies in the UK to use the best available technology today in addition to looking at the next generation that will follow it.

Chair: Okay, that is very clear. We are out of time for this panel. That has been extremely instructive. You have been both candid and clear in your evidence to the Committee. Thank you very much indeed. That concludes this panel.