

Joint Committee on the National Security Strategy

Oral evidence: The UK's economy security

Monday 26 February 2024

4.30 pm

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Members present: Margaret Beckett MP (The Chair); Sarah Atherton MP; Lord Browne of Ladyton; Lord Butler of Brockwell; Sarah Champion MP; Baroness Crawley; Lord Dannatt; Baroness Fall; Angus Brendan MacNeil MP; Lord Robathan; Lord Sarfraz; Lord Snape; Viscount Stansgate; Baroness Tyler of Enfield.

Evidence Session No. 2

Heard in Public

Questions 16 - 34

Witnesses

I: Ed Conway, Economics and Data Editor, Sky News; Matt Evans, Director, Markets, techUK; Professor Basil Germond, Chair in International Security, Lancaster University; Alexander Gray, Deputy Director for External Affairs, Energy UK.

II: Dr Greg Messenger, Associate Professor, University of Bristol Law School; Dr Mona Paulsen, Assistant Professor of Law, LSE Law School; Mark Simmonds, Director of Policy and External Affairs, British Ports Association.

Examination of witnesses

Ed Conway, Matt Evans, Professor Basil Germond and Alexander Gray.

Q16 The Chair: I welcome our witnesses to this hearing. Thank you very much for coming. This is a hybrid meeting. Some members of the committee are attending virtually; one of our witnesses, Professor Germond, is also attending virtually. Thank you very much, all of you.

There is a slightly unusual procedure for us today. We intend to kick off with a question that is specific to one of you and then move into more general discussion. I stress that, although the first question, for example, is to Mr Conway, if others wish to join in with the exchange, please let us know and we will facilitate that.

Mr Conway, what impact would you say the availability of critical materials has on our economy?

Ed Conway: Thank you for having me here. The availability of critical minerals has a significant impact on our economy at present, but that impact is likely to increase significantly in the coming years because we are at the beginning of the process of net zero, which will be very energy-intensive and very mineral-intensive.

Part of the difficulty here is in trying to draw the line about what constitutes a critical metal or mineral. There are certain things that might not fall into that category that turn out to be very important. On most of the different lists of critical minerals—the EU has one and the US has one—copper does not tend to appear, but it is incredibly important for reaching our net-zero goals.

Let me give you an illustration. I know Alexander is going to have some thoughts about energy as well; I am sure he can add to this. If you want 100 megawatts of power, you might want to get that via a gas turbine or via offshore wind. For the gas turbine, you would need about 300 tonnes of iron, which goes into the steel. For the offshore wind turbine, you would need 30,000 tonnes of steel. You would need 50 tonnes of copper to go into the windings that go into the generator and so on in the gas turbine. For the offshore wind turbine, you need 540 tonnes. You would need 2,000 tonnes of concrete for a traditional conventional gas turbine. For offshore wind, for the same amount of power, you would need 50,000 tonnes.

That underlines how the transition that we are going through is not just changing the nature of how we are getting energy, the nature of carbon emissions and so on. We are going to far more mineral-dense and mineral-intensive sources of power. We are doing that at the same time as everyone else around the world. The scale of that demand is pretty extraordinary. It is of gathering importance.

The reason I am slightly hesitant about that is because the UK has diminished as a manufacturing economy in recent years. We currently are not making any solar panels. We have a lot of wind turbines, but we are not really making any of those wind turbines. We are importing a lot of the steel that goes into them. We are importing all the copper. We are importing all these things. Our need for these things is great. Our actual domestic production of a lot of the gizmos that are going into the energy transition right now is not very great.

That brings us to a question that I know you are preoccupied with, which is about the extent to which we are reliant upon other countries around the world. As you probably know, I have recently written a book that is all about this. It is partly about the history but it is partly about the present day. One of the anecdotes in that book is that there was a period around the outbreak of the First World War when Britain suddenly ran very short of binoculars. It was known as the glass famine. Of course, binoculars were incredibly important during the First World War because

you needed to be able to see where you were shooting or aiming your weaponry.

We had gone from having enormous glass production in the early part of the 19th century and in the 18th century—we were a world leader in glass production—to having very little glass production and relying on Germany for 60% of our binoculars. When the war began, we suddenly did not have binoculars. There was a nationwide crisis. There were appeals and people were asked to send their opera glasses and the binoculars that they used at the races to the troops going to the trenches.

The reason I mention this is that, in 1914, our reliance on Germany for these bits of silicon technology was about 60%. When it comes to the energy transition and other technology, our reliance on China for certain ingredients is far greater. For rare earths, the percentage is in the high 90s. For solar panels, it is in that order as well. For the ingredients that go into many of our wind turbines, it is also very high.

The overarching lesson is that Britain often leans quite quickly into laissez-faire policies. That certainly happened back in the early 20th century. The consensus and the conventional wisdom at the turn of the 20th century was, "This is fantastic. We may not have much of a glass industry anymore, but we are getting optical glass and binoculars cheaper than ever before from Zeiss". That is fantastic until suddenly it is not. It does feel a little like those two things—the economic necessity of having something for the cheapest possible price and the security implications of not making any of that stuff yourself—can occasionally clash with each other.

I wonder whether we are potentially at the outset of another of those moments right now. At the very least, it behoves us to think about where stuff comes from a little more. Like I say, the UK typically has tended to lean slightly more willingly towards open free trade. I do not know whether it is a cultural thing, whether it is historical or whether it is the shadow of empire. No one really knows. Is it the Corn Laws? No one is entirely sure, but we do tend to lean willingly towards open free trade as much as we can, and then we suddenly face a bit of a shock if things do not go our way. That is certainly what happened in 1914. My worry is that there is a chance of it potentially happening again with things like critical minerals, so we need to be more alert to where stuff comes from.

When I started writing the book three or four years ago, our understanding of this was pretty primitive. It is improving. The Government are genuinely trying to understand the map of where things come from and inter-reliances, but we still have a very long way to go. It feels like we are quite far behind many of our counterparts elsewhere around the world.

This concerns me. It is right that this is something that preoccupies us. Like I say, we need staggering amounts of these things. We need more copper in the next 22 years than we have mined in the history of

humanity. That is in the next 22 years. This is across the world. When you think about it, a lot of this copper needs to come to the UK. That is the stuff that is embodied within those cables going to the wind turbines. We need staggering amounts of copper.

We need four times more iron in the form of steel in the next 20, 30 or 40 years—in order for other parts of the world to get up to the amount of iron that we have—than we have mined in the entirety of human history. In the future, we will need four times the amount of steel that we have ever mined and turned into steel.

You can say much the same thing about most of the metals that are involved in the energy transition, whether it is lithium, nickel or manganese. We need to ramp up the amount of lithium that we mine around the world faster than any other metal in history. The ramp-up of lithium needs to be faster than that.

The need is great. I am glad that we are starting to think about where this stuff comes from because, thus far, like our predecessors in 1914, we have been quite complacent about assuming that, when you order something from overseas, it will automatically turn up very readily at your doorstep.

Q17 Sarah Atherton: You mentioned the glass famine and history repeating itself. Qioptiq in north Wales is world-leading in sights, lenses and binoculars. Here we are again. Under the UK critical minerals strategy, it is categorised only as “elevated critical”. Most of those imports come from China. If for some reason import is blocked, we cannot make sights and lenses for our military. Here we go again. History is repeating itself. Does the critical minerals strategy do enough to acknowledge that and put in place circumstances that can support our defence sector if the balloon goes up?

Ed Conway: That is a really good question. There is a spectrum of industrial strategy. We are talking about industrial strategy, but we are a bit allergic to it in this country. Whenever you talk to certain people about it, they say, “We are not into picking winners”. No, industrial strategy is also about understanding the nature of what you have in the country and trying to react to it.

Historically, in the last 20 or 30 years, we have been as laissez-faire as we possibly could, apart from in defence. The defence sector has been more activist on this. Think about Sheffield Forgemasters and the various other industries that are seen as critical.

There is a deeper question—this gets to your point—about whether the categories that we choose in terms of what we decide is critical are right. There are certain things that do not fall into the typical basket of being critical. With things such as lithium and cobalt, people tend to agree these are critical materials. But there are certain manufactures and techniques that are very concentrated around the world. I do not know the specifics about this particular plant.

Sarah Atherton: It uses germanium.

Ed Conway: I do not know how many different plants around the world are making those particular products and where they are. Is it just China? These are the questions. We need to understand, for a given product, whether the only other source for that product is in a country that we can rely on. At the moment we are still edging our way towards that understanding.

There is another thing that is interesting, alarming and worth being aware of. I am just a journalist—I am not an expert or a policymaker—but I have spent a bit of time talking to people who understand supply chains. The striking thing about supply chains is that, first, you would be surprised or startled at the extent to which even people engaged within those particular supply chains do not necessarily understand what is happening at the other end of the supply chain. We hope the supply chain is going to take care of itself, but that is not necessarily the case.

Let us think about the semiconductor supply chain. In the course of writing my book, I wanted to tell the story of silicon, going all the way from the quarry through to the silicon wafer fab, where transistors are imprinted on to silicon chips. Very few, if any, of the people to whom I spoke, who worked at those silicon fabs, such as those in Taiwan, could tell me where the silicon in a silicon chip is coming from. Where does that silicon come from? They did not have a clue. The people at the other end did not have a clue about where that silicon was going to go.

Along the way, there are various different pinch points in the silicon supply chain. For instance, if you want to make a silicon chip right now, you need to melt the polysilicon that you get in a particular type of crucible. The crucible is made from something called high-purity quartz. There is only one mine in the world where we can get large quantities of high-purity quartz. It just so happens that it is in North Carolina. It is a place called Spruce Pine. Pretty much all of the transistors or semiconductors that you might find in your smartphone or computer will have had to rely on the quartz coming from one place in the world in order for that to be made. These little pinch points are not much talked about. They do not tend to appear in many, if any, critical minerals surveys.

I have one final point. I was startled at the extent to which our official picture of the world in terms of concentration and where particular goods come from does not necessarily reflect the fact that there are certain pinch points here. I will give an example of this. There is a factory that I went to just outside Birmingham. It is called Brandauer. It used to make fountain pen nibs. These days it makes high-precision pressed pieces of metal.

I know this is an anecdote, but it ends in a broader lesson, I hope. On the day I visited, it was making a particular type of small electrode. I asked what the electrode was for. They said, "It goes into the rear-view mirror of your car. It is the thing that does the auto-dimming. It helps activate

auto-dimming in your car". I said, "How many of these are you making?" They said, "We are making hundreds of millions". This particular factory, this little place outside Birmingham, was responsible for more than 50% of all the electrodes going into the rear-view mirrors of every car around the world.

This is just one place in Birmingham, but this underlines a point about the way we have arranged the world into a globalised and incredibly efficient set of supply chains. One of the consequences of that has been to concentrate the production of certain components into a small, finite number of places. Every other car in the world has a little piece of metal from Birmingham in it. I imagine that there are hundreds, if not tens of thousands, of these components that come from a single factory or maybe two factories in the world.

Again, our understanding and analysis of those concentrations and particular pinch points is quite primitive, which again goes to your point. In the event that this particular factory cannot function or struggles, we need to understand what the alternatives are and how many different factories or companies around the world can provide us with this particular component. A lot of the time, the answer is surprisingly few, which is quite enlightening. We tend to think there is a limitless pool of components, products or metals that we can pick from—we are a free-trading nation and, if we need something, we order it. But, first, it does not seem like the global economy is configured in that way.

Secondly, we are now in a very different world geopolitically, as you will know better than I do; we are in a scarier world right now. Thirdly, right now there is a race for a lot of these materials at the same time, particularly when it comes to the materials that are relevant to the energy transition. That race is pretty unco-ordinated, and we do not really have the multilateral bodies that we might like to have to co-ordinate it. Finally, for better or worse, post Brexit it is unclear, diplomatically, which bloc the UK is going to be more aligned with. That is a point of potential instability. Again, that is unsettling.

Matt Evans: I just want to jump in to make a swift supplementary point. I and techUK sat on the task and finish group that fed into the Department for Business and Trade's critical minerals work. You are right to say that germanium is one of the 17 or 18 critical minerals on that list that it looks at. The task and finish group tried—it was the first time that the UK has tried to do it—was boil that down into six sectors.

For the electronics sector, germanium is absolutely critical. The requirement to do that with a sectoral approach is the next step for the UK. That is what we would really like to see. The reason for that is the quantity of germanium, for instance, that we are importing may be too small to show up in generic cross-economy trade stats, but it does not mean it is not absolutely critical both in the example that you have given and in compound semiconductors and other applications such as that.

Getting into where the criticalities are is really important. We certainly think that is the next step that Government need to take. They need to start looking at a sectoral approach as well as minerals in the round.

Sarah Atherton: This might be a daft question, but can you stockpile these minerals?

Matt Evans: You can in some instances, but there is a cost associated with that.

Q18 **Lord Browne of Ladyton:** I was not intending to come in on this question, but I am absolutely gobsmacked by some of what I have learned here. Before I ask a question, since I have not asked any question or spoken publicly in this committee, I need to refer people to my interests. I have a House of Lords declaration of interest, but I draw attention particularly to my relationship with the Nuclear Threat Initiative. Part of that is remunerated because I do consultancy work for them, but I am the vice-chair of this organisation.

I am a director, a trustee and the chair of the European Leadership Network for Multilateral Nuclear Disarmament and Non-Proliferation, which I helped to set up with others. I am a director of an organisation called the Clean Growth Leadership Network. I am a member of the international advisory council of Afrobarometer, which is a non-partisan pan-African research institution focused on democracy and governance. I am an ambassador of the Halo Trust, which everybody knows is a charity engaged in mine clearance and conflict prevention.

Ed, I am not sure anybody else has any idea about the scale of the challenges with which you introduced your remarks. I am not even sure the Climate Change Committee has. I have never heard it speak about these. I have never seen any of this discussed in any reporting of COP. I wonder whether it is possible to do this.

The point I really want to make is that I doubt very much that our critical national infrastructure will include a company that makes a whatsit for dimming rear-view mirrors.

My experience as a Member of Parliament in the west of Scotland, in what at one stage was a very industrially intensive area, was that venture capital has been consistently consolidating businesses and industrial production for decades. If we want to find out the impact of this consolidation on critical minerals, we should ask the people who control the money, because they do it. They literally wake up one morning in New York and decide that they can consolidate something, get rid of the redundant stuff, concentrate it and make money out of that. Did you do any of that when you were writing your book or doing research for it?

Ed Conway: That is a very good question. Undoubtedly, the UK has deindustrialised, which is a part of this, faster than any other developed economy save the post-Soviet states in the 1990s. We have deindustrialised at an incredibly rapid rate.

That is not to say we do not have some incredibly advanced, sophisticated and highly skilled manufacturers that remain in this country. We have a large number. We are still a very big manufacturer, but the speed with which we made that change is unprecedented outside of war and distress.

There are lots of explanations for that. Ownership might well be a part of it. Energy costs have rather a lot to answer for because our economy has some of the highest energy costs in the developed world. This is a very primitive lesson, but, in trying to understand the nature of the foundations of the modern economy, one of the lessons I learned was about how essential energy is to absolutely everything we touch and everything we do. We are starting to realise that post Russia's invasion of Ukraine.

Everything, from a piece of fruit that you eat to any particular product that you touch on a daily basis or this glass bottle, is reliant on enormous amounts of energy to produce it. That energy is far more expensive in the UK than elsewhere. A lot of the decisions that you tend to hear about, such as the decisions being taken right now to do with Tata, are ostensibly on the basis of how much it costs to make steel in the UK, for instance. Right now, the cost of making steel in the UK is higher than in most other parts of Europe because our cost of energy is far higher than in most parts of Europe. There are other things going on with the nature of the particular business in Port Talbot.

The UK has deindustrialised very quickly. We have also had a far more liberal attitude towards selling off businesses. We do not protect businesses in the way that, for example, the French and, to some extent, the US tend to. That perhaps has started to change. What happened recently with Newport Wafer Fab was rather interesting on that front. I am still trying to understand the extent to which that decision was based more on national security or industrial strategy, because it seemed to have a bit of both ingredients.

We typically have allowed countries from around the world to buy our businesses. I do not know the extent to which that helps explain the rate at which we have deindustrialised. I would say it is slightly more down to higher energy costs and other factors like that. Undoubtedly, it is true that the scale of our industrial sector has cratered in recent years. That has had a bearing all around the world.

There is another thing that has not helped the UK. We invented the lithium-ion battery. We invented the main cathode chemistry for lithium-ion batteries, which is arguably one of the most important inventions of the 20th century. The main invention happened in Oxford, yet the vast majority of batteries were essentially manufactured in Japan. The clichéd view of this is, "Hang on. We invent loads of stuff, but we do not end up making it".

The interesting thing with that particular example is that there was a company called AGM. It was associated with the Atomic Energy Agency,

and it was based just outside of Thurso. The company started making lithium-ion batteries faster than any other company around the world, including Sony. It was able to make bigger batteries faster, but the issue was that it was not making them to go into products such as camcorders. It was making them to go into nuclear submarines. There is only so much of a market for batteries going into nuclear submarines. If you are making batteries to go into millions of electronic devices, you have a far bigger market.

To some extent, the UK's focus on specific smaller sectors and the fact we do not have an enormous electronics manufacturing sector have meant that other bits and pieces of that cosmos of manufacturing have not been able to function as effectively as they have in other countries. A lot of different factors play a part, but energy is very high up on the list.

The Chair: This has been a very interesting exercise, but it is taking quite some time. I know Mr MacNeill wants to come in and I think Mr Gray also wants to. I will take Mr MacNeill first, but could I ask both of you to be succinct?

Q19 Angus Brendan MacNeil: That message is received and understood, loudly and clearly. Last week, my committee went to Denmark. Energy efficiency is a big thing in Denmark. Being energy-efficient is a national characteristic; it is something that Danes aspire to. They are tapping into energy everywhere. One of our members noted that, at a cement plant in England, getting rid of heat is a problem, but, at a cement plant in Denmark, it is seen as something of a bonus because it will go into a district heat network very quickly. I just mention that as an aside.

I missed the very first bit when you were talking about mineral availability. I heard or read in the last year or so that the same volume of copper that has been mined since the Bronze Age will have to be mined in the next 30 years to meet the transition, particularly for motor cars and everything else. Do you have a comment on that? Is there any recognition of that statistic: that in the next 30 years, we will have to mine the same volume of copper that has been mined from the Bronze Age up to this point in time? This is the balancing point. There is going to become a point of peak copper or a copper pinch.

Ed Conway: Yes, you are absolutely right. In the next 22 years we need to mine more copper than we ever have done in the history of humanity. The number of copper mines out there that are potentially promising is diminishing. The grades of copper are getting less promising. The willingness of people in countries such as Chile and Peru to open these mines is also diminishing. The extent to which we are helping to fund and encourage the mining sector has gone backwards rather than forwards in recent years, partly because people associate mining with dirty stuff. Frankly, it is dirty. Having been to lots of these mines, I know that it is very dirty. That seems like a risk.

The UK has some of the most prominent and highly respected mining colleges in the world at Imperial and at the Camborne School of Mines in

Cornwall. The Camborne School of Mines recently had to shut down one of its courses in mining engineering because there were not enough applicants. Everyone wants to go off and do something else because they think mining is dirty. It is worrying in various respects. If we are going to get to net zero, we desperately need a staggering amount of these metals. That is the key to getting there. We are going to build lots of amazing infrastructure that will mean it is going to be a lot cleaner.

I am sorry. I will not go on too much, Chair; I know I have a tendency to. It is worth saying that we do not need to build up this infrastructure just because we like building stuff. When you have lots of wind turbines, yes, they take a lot more copper, steel and concrete, but we do not have to feed them with fossil fuels. This is a positive story. However, in order to get to that promised land in the future, we need to mine a crazy amount of metal to satisfy all the promises that we have made.

We need to be open and honest about that. Frankly, we need to be encouraging the mining sector to get that stuff and we need to get as many young people as possible into the sector because it is part of the solution in the future.

The Chair: Although you are right that they think mining is a dirty business, it goes back to something Lord Browne said at the outset about not having heard that conversation as part of the conversation around the COP and the discussion on climate change. They probably also think it is a technology of the past and it is not relevant to all the stuff we need to do in the future. That is an important point. Mr Gray, you wanted to come in.

Alexander Gray: Thank you very much, and thank you for the invitation. I cannot talk specifically to on-the-ground minerals production and exactly how much we will need. There are brains far greater than mine, and indeed those who have written books on the subject, who will be able to talk in detail about that.

One thing in my world, in energy, that you can look at is gas. That is a mineral that we have been heavily reliant on for the last couple of decades. In the last couple of years, and indeed today, we are still experiencing the effects of relying on a gas that, by and large, we import and that is therefore subject to global commodity prices. Regardless of how much domestic supply there is, it is still traded and sold on a global market.

To put that into perspective, over the last two years, we spent about £75 billion more on our energy bills than we would have done if we were not so reliant on gas. The price of tomatoes, for example, which Ed was alluding to, has gone up about 40% in the last two years because of rising input costs for growers, which is primarily energy.

When we talk about energy and economic and national security, we are really talking about energy, which feeds through absolutely everything in the economy, from heavy manufacturing, input costs there and how

competitive we are on the global market, all the way through to households and how much they can afford their weekly shop. Some of the latest figures show that around 5 million households in this country are currently in fuel poverty, by and large because of their energy bills.

We talk about the minerals that are needed. Yes, there are very large figures. We are pretty confident that we will achieve it. The alternative is that we are left behind and we do not go through this huge energy transition, which is responsible for a huge number of jobs. Right now, the energy industry employs about one in 48 people in this country. It is absolutely huge. The alternative is that we will have to rely on these high input costs for gas or coal—or we can power that energy from the United Kingdom.

Q20 Lord Dannatt: In the conversation so far this afternoon, we have touched on quite a lot of risks, probably rather more than we are all comfortable with, but it is risks that I want to ask you about. The Government have their energy security plan. Have they identified the correct risks within that plan? We have heard a lot about risks this afternoon, but have the Government identified the right risks in their own energy plan?

Alexander Gray: Are there any specific parts within that plan that you would like me to comment on? I can give you a very broad view.

Lord Dannatt: Start with a broad answer.

Alexander Gray: The Government have outlined the right ambitions in the right areas. There are risks that we will all be aware of, from physical risks to cyber risks. It would not be appropriate for me to comment on those specifically at a power station level, but you will not be surprised to hear that the industry is having very detailed discussions quite frequently with the relevant security services.

In terms of the strategy itself, the real risk is hitting those targets and what is needed to do that. Our discussion has gone right down to the mineral level, but it is not just that; it is the skill set, the planning regime and the financing. We are going to need around five times more capital to reach some of our targets by 2030 compared to 2020. We are going to need a significant increase. We are very lucky in this country. We have the City of London. It is a global leader, but there is a global race for capital.

When we think about the risks, yes, there are physical risks, cyber risks and risks around intellectual property, et cetera. Those are rightly identified, but there is a broader narrative that comes down to the manufacturing points that we have spoken about as well.

Lord Dannatt: Yes. We have touched on those in the conversation so far. Going back to copper, we are going to mine more in the next 22 years than we have ever mined before. That is a risk. You have just touched on capital. There are many risks that have to be balanced here.

Alexander Gray: Absolutely. The big risk in all of this, which we always need to consider, is how it impacts household bills. A lot of this will be privately financed. The private sector will be responsible for around two-thirds of all the funding for net zero. We absolutely need to make sure that we take people and households with us.

To the point that was made earlier on energy efficiency, the United Kingdom has some of the worst-quality and lowest-efficiency housing in western Europe. We have a significant thing that we need to do. The cheapest and most secure energy we have is energy that we do not need to use in the first place because our homes are of far better quality.

Q21 **Lord Butler of Brockwell:** I am going to go on from the energy security plan to the international technology strategy. Of course, one does not need to emphasise the importance of technology over the next few years. We all remember the anxiety that the Government had about Huawei and our mobile phone technology. There are now worries about the possible merger between 3 and CK Hutchison. This will affect not only mobile telephones but AI, advanced robotics, computing hardware, data infrastructure, and satellite and space technologies. It will have huge importance for technology.

In 2023, the Government published their international technology strategy. Let me quote one bit of it, which says, "This strategy sets out how we will achieve our ambitions and our vision of the UK as a centre of excellence, able to build our alliances which can win the global battle for technology influence and enable our values of freedom and democracy to thrive". Perhaps I ought to address my question to Mr Evans in the first place. How effective have the Government been in building that international co-operation in the technology sector? Is that likely to be sufficient to protect us and maintain our economic and national security?

Matt Evans: First, thank you for inviting me this afternoon. To give you a brief overview, techUK is the trade association facing the digital technology sector. We represent more than 1,000 members right across the country. About 650 of those are SMEs while the rest are large multinational corporates. Unlike a lot of other international technology-focused trade associations, we represent people on both the chips side and the clicks side—that is, in both hardware and software.

When you look at the international technology strategy, you also have to look at the UK science and technology framework that underpins it. We welcome that framework. Our conversation has touched on industrial strategy. This is probably the closest thing to an industrial strategy for the UK tech sector that we have and have had for at least the last decade.

We think that the framework is largely operated in the right areas. It focuses, as industrial strategy has to focus, on the correct key technologies, which include AI, quantum and engineered biology. Ultimately, the proof is in the delivery of that. As you said, it was published last year. There are some things where we still need to see

government join-up. We want to be world leaders in compute power. People can sometimes—we do this as well—fall into talking about the cloud in a very theoretical application. As Ed has pointed out, all things come back to firm, concrete areas. That means data centres. If we want high-power compute in the UK, we need large numbers of data centres.

We are a European leader but there are high input costs. Energy is one. Planning is another, which introduces a really significant risk in terms of the development and deployment of those. Recently, the UK Government have attracted significant investment into data centres, focused on building their AI capabilities. We really welcome what the Government have started to do in this space but there is more that can be done.

When we look at the international aspect, there have been a lot of conversations around friend-shoring. If we are not going to build manufacturing capability for semiconductors in the UK, for instance, can we sign international agreements to ensure that the UK economy has access to those? The automotive sector is one of the biggest demand drivers for semiconductors in the UK economy.

We have seen some really positive work in the UK-Japan agreement. We have seen some initial positive work in the Atlantic declaration with the US. There is a lot more that needs to be done. As we have now moved away slightly from signing free trade agreements, we need to make sure that our international technology strategy is really baked into our overall trade strategy as well. That is where we would like to see the Government go and evolve on this.

Lord Butler of Brockwell: What would be your priorities for the next steps on international co-operation in this area?

Matt Evans: What the UK has done with the AI safety summit is a strong example of how the UK can try to shape the regulation of many of these future technologies. We regard Bletchley Park as a really significant success, not least because companies and Governments came together and agreed to hold another summit, which is usually a decent barometer that the initial one was worth while. This gives us a real opportunity but it has to be matched by the UK being both principle-based and fleet of foot when it comes to some of the regulatory challenges. If we can get it right, we can attract investment by being the country that is dealing with some of these big issues.

The other priority would be matching up the overarching principles of the strategy with core delivery. That means making concrete deals with like-minded countries to ensure that we are developing the key technologies that bring a significant economic advantage to the UK.

Lord Butler of Brockwell: You have said that there is an awful lot of work to do. What countries and areas would you highlight in particular?

Matt Evans: With AI, you have to look at the US but also China, Japan and elsewhere in Asia. The fact that China was at the AI safety summit

was of real benefit, particularly because of what the AI safety summit was looking to do. There are a lot of other areas where you would want to collaborate with EU countries, with the US and with other NATO allies. Some of the things that the UK is doing via the AUKUS treaty, for instance, could be quite beneficial and to the UK's economic advantage.

Q22 Lord Sarfraz: I have a question on compute power. Do we have enough? Are we heading in the right direction? Do we have any numbers on what impact it has on energy demand?

Matt Evans: That is a big question in the sector at the moment. The UK is very well positioned. We have the largest data centre sector in Europe. We have a really good centre of expertise around that. In terms of what future AI applications are going to mean for energy intensity and energy demand, we are still quite early on in understanding that. Certainly, the current models require a lot of energy to be trained and utilised, but the sector is doing a lot to try to minimise those energy costs.

Because of the high energy costs that we have seen in the past few years, data centres have moved to onsite generation as much as possible. You have seen a strong rollout of solar PV. You have seen data centres using what are known as power purchase agreements to incentivise more renewable rollout because they will be an anchor tenant for that as well.

There is certainly a lot more that both industry and government need to do to unlock that. There has been some very good investment from the UK Government in terms of both attracting companies that are quite significant players in this area to invest in the UK and, through their high-performance compute strategy, putting their own investment into new supercomputers, for instance in Edinburgh, Bristol and other areas.

There is a lot there, but this is a high-capital game. The more we can do to incentivise private sector investment, the better it is for UK plc.

Alexander Gray: If I can come in on your energy question as well, I cannot speak specifically for the data centre sector but, as a broad economy, our electricity demand is forecast roughly to double by 2050. That shows how fundamental it is to get our energy policy absolutely right. It is fundamental to economic security if we want to have data centres, AI, data processing and these technologies of the future.

It does not just stop there. For example, gigafactories are very important to the United Kingdom's automotive sector. Energy is a huge input cost for them. We need to get our energy policy right. Matt talked about self-generation on site. There are lots of blockers where the Government could tweak things—or, frankly, get out of the way and let the private sector do it—to enhance our economic security.

Q23 Baroness Fall: You mentioned capital. Of course, tech is at the forefront of China versus the West versus the USA. America has thrown a lot of money at its tech security with the IRA; I should not put it quite that way, perhaps, but that is how the Americans talk about it. Do we have

the capacity to have our own version of that? Is there going to be an EU version that stands up? Do we need to have a G7 tech response?

Matt Evans: I am happy to start on that. The Inflation Reduction Act, which you referred to, has particular relevance for the tech sector. The impact is not just in renewables, although there has certainly been an impact there, but also in semiconductor strategy. That tends to be where the most tangible impact is felt. This really means tax incentives for, in the US case, the onshore fabrication of semiconductors in the US. There is a similar move with the European Chips Act, it is fair to say. Given the size of our relative economies, as well as the multiple billions that the US is throwing at this and the EU is likely to deploy, it is probably not feasible for the UK to attempt to go down that route.

If you look at the semiconductor value chain, that is not necessarily where our strengths are in any case. Before you get to the fab, you need to spend a lot of work on design, patenting, how the chips are going to work and how security is embedded within them. That is where the UK is genuinely world-leading and accounts for a significant percentage of both patents in that area and intellectual property.

The Government have made a sensible case for doubling down on the design element, in which we are already world-renowned. There are about 25 fabs in the UK; that is around 0.5% of global chip supply. Those chips are used in some interesting applications—we do not want to ignore those—but large-scale fab deployment is incredibly capital-intensive. It is a better use of capital to deploy it in making sure that our patents and intellectual property continue to be world-leading, making sure that the skills base is right for that and making sure that markets can access it, rather than going down the other route.

Q24 **Angus Brendan MacNeil:** Today's session is about the UK's economic security. We can go down rabbit holes of concern and worry about where we can get chips and whatever from but, versus other countries, is there any index that could tell us about or give us an indication of which countries are more economically secure, within the wide parameters of what we are discussing today, and which are the least economically secure? What steps can countries take to become more economically secure? Otherwise, you might be in a position of angst in thinking about the next steps to reduce what you perceive as economic insecurity, whether it is actual or relative to other countries.

Ed Conway: In terms of physical chip manufacture, perhaps the most secure would be Taiwan or South Korea in terms of manufacturing.

Angus Brendan MacNeil: Let us take everything together, not just chips. They might be secure on chips and whatever but there will be other areas where they are not secure. If we take this idea of economic security together in a bundle, which countries are secure? It may be the United States due to its size or whatever.

Ed Conway: If you look all the way along what it takes to make a silicon chip, probably no other country has as many parts to play at each of

those different stages as the United States. The challenge is that no silicon chip is made in one single country. The idea of trying to assume that you will be able to make a silicon chip in one given country is for the birds.

Angus Brendan MacNeil: Are we looking at a world where every country has degrees of economic security?

Matt Evans: Yes; I would argue that case. It goes to a wider question. When you talk about national security, it is a well understood concept. I would say that economic security, particularly in the tech sector, is far less well understood. We want to see the Government start a conversation around what we mean when we talk about economic security; we are very happy that this inquiry has started on that. We are aware of the policy instruments that can live in this area but we want to ensure that it is not conflated with national security. We want a clearer understanding of economic security both in general and in the tech sector.

Angus Brendan MacNeil: Will it ever be possible to get to a position of total economic security? I really doubt that it would be possible. You would be going back to Éamon de Valera's Ireland, or somewhere like that, where they were trying to create absolutely everything on the land and not trade. Ultimately, that is the only way you could get full economic security, but it would be very expensive for peacetime.

Matt Evans: I think so. I cannot speak on the wider economic point. Look at the tech supply chains that we have across the world. As an example, I have a smartphone in my pocket. They are both members so I cannot name which one. In its supply chain, you are talking about 3 million people, 52 countries and thousands of companies and organisations, from smelters to software developers. This is on both the hardware and the software side.

If you were to try to onshore that, it would take you an age to understand all the different components that sit within that one supply chain for that one item. It also would not lead to you being more secure. Certainly, we do not see security and openness of trade as necessarily being in tension with each other. You very much want both of those because that is how you deliver each of them.

We absolutely need mitigations around what is clearly an open global trading order that is under pressure but you can certainly swing the barometer way too far, and that would limit economic growth as well.

Q25 **Baroness Fall:** I want to address the issue of maritime risk, which is very much in the news at the moment with the Houthi attacks in the Red Sea. We also hear a lot about the South China Sea and lightened loads going through the Panama Canal. How effective is the UK Government's policy to address these issues? How does it affect our—the UK's—economic security?

Professor Basil Germond: Thank you for inviting me. My fields of expertise are maritime geopolitics and sea power. As you can imagine, I have a lot to say in answer to this question. Please feel free to interrupt me; I am conscious of the time.

First, the sea is extremely important for the UK's economic security and national security. We all know the numbers when it comes to the global supply chain. Some 90% to 95% of import-export in volume happens by sea. We also understand that it is not just UK trade. The service industry also depends on the sea because the hardware or infrastructure that it uses is dependent on freedom of navigation because there is a need to import stuff by sea. We also can talk about critical national infrastructure, et cetera.

I start by saying that the question is not, "Is the sea important for the UK's economic security and national security?" It is, "Why is the sea more important today?" It is because there is a conjunction of geopolitical, economic, technological and resource factors playing all together.

At the geopolitical level, we have disruptors. We have the UK's competitors or enemies. They are trying to disrupt freedom of navigation. That is in the context of the impending global leadership challenge by the forces of authoritarianism, which are contesting the West's global dominance. The West's global dominance is based on our ability to control the global maritime domain; that is very important.

Secondly, you have technology because of AI, automation, machine learning and cyber. If you combine those technologies with more traditional technologies such as missiles and drones, you understand that it gives our competitors an asymmetrical advantage to disrupt freedom of navigation. The Russians tried that in the Black Sea and failed. They failed because Ukraine efficiently used these asymmetrical means. In the Red Sea, the Houthis are using asymmetrical means. As a consequence, the UK and the US are spending a lot of money and resources. We saw that last weekend with some more air strikes.

This brings me to my last point, on resources. We have few resources and decisions have to be made now in terms of what we invest in, when, how much and for which theatre of operations. It is not really a question of derisking; it is more geopolitical. We have to prevent, pre-empt and deter threats and malign actors. We have to have the capacity to intervene to control the maritime domain. For that, we need more early warning capabilities, intelligence and resources to pre-position forces around the globe. For that, we need investment.

In its 2021 report, the Defence Committee of the House of Commons made it clear that we need a bigger Navy; that is right. We still need a bigger Navy but the investment needs to be made now, not just for the navy but for our ability to intervene all over the world in the maritime domain. The decisions that we make today will come to fruition in 10 or 20 years, so it is very important to think about that now.

In further answer to your question, there are two other things that HM Government need to take into consideration. The first one is something that they have been very good at: making the most of international co-operation with like-minded states, partners and allies because, to be able to control the maritime domain and uphold freedom of navigation, we need economy of scale and critical mass. It is only by working with like-minded partners that we manage to achieve our goals.

HM Government have been good at that but now, in the current context, it might be time to explore a way—I cannot say “to broaden the coalition” because a coalition is only with like-minded states—to expand the scope of the way we co-operate externally in order to find avenues to improve freedom of navigation. We can think about how to better engage with swing states such as India, Indonesia and Brazil, perhaps with capacity-building.

It is also about how to engage with China. China is extremely dependent on freedom of navigation because the power base of the Communist Party is the economic growth of China. This growth is based on trade, and trade is based on freedom of navigation. Is there a way to give opportunities for China to be more inclined to put pressure on actors such as the Houthis? That is how I would answer your question but I would be happy to elaborate on any of those points.

Q26 Lord Sarfraz: Professor Germond, you referred to the role of the Royal Navy in keeping the sea lanes open. Given the financial pressures on the one hand while, on the other hand, companies in the shipping industry such as Maersk are profiting—in 2022, it made \$30 billion in net profit—should they be co-operating and contributing towards these efforts more?

Professor Basil Germond: Definitely. HM Government have developed a sort of trinity around improving maritime security. There is the whole-of-government approach in co-ordinating our assets; there is international co-operation with like-minded partners; and there is public-private partnership. However, there is still a way to improve this.

You mentioned Maersk. It is very interesting because, in Denmark, there is some sort of organic relationship between Maersk and the Danish state. HM Government have been good at nurturing the relationship with the private sector but, in the current context, it is not just about maritime trade; it is also about the critical undersea infrastructure that is owned not by the maritime industry but by big tech. It is really important to find a way to develop relationships with the private sector that are reciprocal, bidirectional and organic because HM Government want and need to harness the power of the private sector to protect sea lanes of communication and our interests at sea.

If we want to do that, we also need to take into account the commercial interests of the private sector. It is only if we do that that we will be able to make the most of the capabilities they offer. Also, that is the way to make sure that the private sector understands that it has a moral duty, in the current context, to work towards a stable, liberal world order.

Q27 **The Chair:** We are coming towards the end of this panel but there are one or two supplementary things that we want to pursue before we move on. Mr Conway, can I come back to you? We talked quite a lot about critical materials and minerals. The Government are supposed to be implementing the critical materials strategy. Are the steps that they are taking sufficient to implement that strategy? Are there gaps that need to be pursued?

Ed Conway: They are more serious and more sophisticated than we have seen thus far. There is still certainly more that could be done but the latest review is a lot better than everything that came before it, if I can put it that way. Part of the issue here, or an important overarching question, is this: which institutional devices and frameworks, or just institutions, will ensure that we do not just get a series of particularly interesting reports? How do we see this turn into policy that can help this country to secure the minerals and the energy that it needs in future?

I have an interesting analogy on this for the UK at this moment: think about what a country that has been thinking about this stuff for a long time does, and how it does it. One interesting example here is Japan. Japan has historically been mineral and energy-poor compared with a place such as the UK, and it has been conscious of that for a long time. It has an institution called JOGMEC—its full name is the Japan Oil, Gas and Metals National Corporation—whose job is to think about how to ensure that a country such as Japan, which does not have much in the way of minerals in the ground, can get hold of this stuff.

We have never really had institutions like that in the UK. Part of the reason why we have not really focused on that kind of thing in the past is that we have been quite fortunate. We have quite a lot of geological abundance in this country. Historically—indeed, until quite recently—we were an energy superpower. A hundred years ago, we had enormous amounts of coal. Some 80% of the world's coal came from the UK. Then we shifted from that, when coal became less important, to having rather a lot of North Sea hydrocarbons.

We have been energy-rich and, to some extent, mineral-rich for quite a long time. This has meant that we have not necessarily created the same frameworks and institutions as other countries that have not been as fortunate as us in the past. We have not created those institutions but we need to think about them because we are now in a period where, for the first time in industrial history, the UK is not fortunate when it comes to energy. We are more exposed than we have ever been to imported energy. Like I say, it is worth remembering that we have no institutions in modern industrial history in this country to compare that to because we have always been very fortunate. We have always been able to rely on getting hold of cheap energy and mineral resources in this country, such as cheap copper and tin and all of those things that mattered.

I hope that the initial reports create certain institutions. My concern is around where those institutions reside. Do they sit in the Treasury? Do they sit elsewhere? How can you get the Treasury onside? It is an

incredibly important institution and there are question marks over how enthusiastic it is about this kind of thing.

The Chair: Industrial strategy is not necessarily the Treasury's strong point. Thank you very much indeed. I said that we had one or two other issues. If you do not mind, we might write to you afterwards, because I am conscious that we have two or three other witnesses waiting to come and join us. At this point, I thank you all very much indeed for what has been a most stimulating set of exchanges. Thank you for coming. As I say, if we may, we might write to you to pick up on one or two things that we have not been able to reach.

Examination of witnesses

Dr Greg Messenger, Dr Mona Paulsen and Mark Simmonds.

Q28 **The Chair:** Thank you very much for coming; we appreciate it. We will go straight into questions. The first question is for Dr Messenger. What has been the Government's approach to derisking their supply chains and critical industries?

Dr Greg Messenger: Thank you for the invitation and for an easy opening question. As we have already heard, a number of strategies are out there. We have the semiconductor strategy, the critical minerals strategy and the energy security strategy. What is perhaps more useful is to frame it as five overarching themes that can cut across all of these.

The first is, in general terms, protecting UK interests in what I think is a relatively conservative fashion. This includes things such as investment screening, but only on the grounds of national security; export licensing and concerns that products could be dual-use, for example; and trade remedies. These are instruments that we use to protect UK businesses from subsidised or dumped goods or unexpected import surges. They are a bit of a techy trade issue but they are of particular relevance because most trade remedies, if I am blunt, are targeted towards China and products from China that injure UK industry. If they are not, they are often targeted towards Chinese subsidies that are applied extraterritorially; we have seen this with products from Egypt, for example. That is one part of it.

Where it gets more interesting—this is some of what was being discussed slightly earlier—is ramping up information and data collection, which is extremely important. As we have heard, the traditional position is that businesses know their supply chains better than we do; I say this with a perspective from inside government. In practice, we know that that is not the case: not everyone does because supply chains are very complex.

It is not only that. You could be a very good business, know your supply chain and say, "Look, we have three different suppliers for X product", but not realise that all of your competitors are using the same supplier as well. Suddenly, those options are not all that helpful, so you need an

external party to be able to do that, which is part of the work that the Government have been doing. It is about the collection of data, which I suggest is also useful in wider areas; we can touch on later that if there is time. It is a helpful exercise to do in relation to opportunities for UK interests generally, particularly in things such as environmental services, liberalisation and goods.

It is then about communicating that data and information, working closely with businesses to make sure that they all work together with the Government to know what is going on with that data. This means things such as stress testing, risk assessments and so on, but also working with other Governments. We are seeing examples of that communication with other Governments; those are what we might consider like-minded or friendly Governments, for want of a better term. Korea is a recent example where there has been some stress testing.

The principal tool that the Government have been using—it is one that really threads our historical position in trade generally—is the fact that our openness to trade is not an accident or a weakness but a benefit of the system and a core UK interest. The best way that we can ensure resilience and security is by ensuring that we have as wide a selection of businesses, traders and producers available as possible.

We do that, in essence, through leveraging institutions of trade: the World Trade Organization, free trade agreements and the market access work that goes with all that. This is about ensuring that we try to reduce barriers to trade when they arise. It comes off the back of one of our most skilled and greatest assets, which has not yet been mentioned: our large overseas network of embassies, consulates and missions, which do a lot of this work on the ground. There is also the work from capital, which cannot be done without their input.

Finally, there is one other theme that is, frankly, very underplayed. We have been hearing a lot about the transitions, net zero and sustainability. Within this context, frankly, it is a lot less explicit than it is elsewhere. In the EU, for example, there are ongoing discussions around the circular economy and so on. In the UK, the priority is more about not accidentally triggering a race to the bottom in relation to environmental standards and when we are talking about extraction. That is another theme, which is slightly lower down in terms of its explicit nature.

In terms of activity, that is where we sit at the moment. It is about leaning into a wider and more open trading system as the backbone of our approach.

- Q29 **Baroness Fall:** I agree with your point that a lot of this is about China. What is your view on how we can help the private sector comply with economic security issues, because they get thrown around a bit? We saw that with Russia-Ukraine, when there was a movement to divest, but also with friendshoring and just complying, as much as possible, with the new National Security and Investment Act, for example. I am very interested to hear your views on that.

Dr Greg Messenger: It is a real challenge. The starting place is that we have an advantage from the process that took place during and after withdrawal from the EU which, in effect, created a trade policy from scratch. That was not during negotiations because, frankly speaking, business was not particularly welcome within negotiations, but subsequently, in terms of implementation and trying to manage trade, businesses have had to be very engaged, and the Government have had to turn their position and really engage quite effectively and as best as possible. That is not a thing that is just done; that has to be an ongoing relationship. We are starting from a benefit in that regard.

There are two different angles of compliance when we talk about economic security. On the one hand, when we are concerned about things like security, and much more explicitly that national security element of economic security, we are talking about being open and honest and being able to share information, wherever possible, to better understand risks that the Government are very sensitive to. Not all businesses will be fully aware or sensitive to just how serious some of the security risks are and what the direction of travel is.

Russia-Ukraine is a useful example, from when sanctions began and started ramping up. We recall that, early on, it was not about import and export bans; it was a slight increase in tariffs and then progressive increases. Many businesses were calling for it all to be ramped up straightaway and for everything to go to 100 straightaway, because they did not want the uncertainty; they wanted a sense of, "We have a good idea where you're going. Can you please just tell us? We'll exit and adjust accordingly". That clarity is very important.

The challenge is when economic security starts bleeding into other areas of wider resilience and so on. That is a great uncertainty for business and in policy terms generally. There, again, it is going to have to be about communicating as open and frankly as possible. The best-case scenario in that instance is information sharing, so that we have a bit of a heads-up in terms of the sectors and products because, as we heard earlier, where the risk comes from will depend, vary, shift and move around. We need to be able to communicate that as effectively as possible.

Dr Mona Paulsen: With respect to this point, the key here is that, traditionally, the fields of economic and security were kept quite separate in the way that we conceptualised these concerns. Now, with the concept of thinking about economic security, even the name itself merges those two ideas together. It is an interesting challenge to have private firms or economic actors having to contemplate these kinds of security consequences without being fully aware of what the Government are privately concerned with.

For example, a firm may be asked to pay more from a supplier that is different from one that the Government have deemed to be a security risk. To echo Dr Messenger's concerns, this question is about how much knowledge the Government will provide to these private actors without then incurring a security risk in itself by disclosing information.

This raises new challenges, both within the Government and to private actors, but also an open question about international co-ordination. If we are living in a highly integrated, globalised economy, there are questions for multinational corporations about whether they will be within the purview of security concerns with those subsidiaries that are in other parts of the world, and how that connection comes.

There are increased challenges, which is why transparency and notification as early as possible, and clarity and predictability in that, are quite key. There are certainly concerns that come with that because, when it comes to providing evidence, national security risks are obviously at the top of where a Government would have no pressure to provide or disclose information.

Mark Simmonds: I agree with everything that has been said so far. I am from the British Ports Association. On the sanctions specifically, we would have liked to have seen more resources from the Government to help deal with some of those. Our experience was that, to begin with, ports were in fact asked to enforce sanctions on certain cargoes and vessels, which it was not possible to comply with. Legislation was then brought in and there was very little support on how we were supposed to implement it. That was very difficult.

Even now, there has not been a huge amount of support forthcoming in that area. Some of those rules can be quite complicated. Some of our ports will have legal teams that can look into that and advise them; others can be very small entities indeed, so it can be quite a challenge to implement things like that. We would have very much appreciated a bit more support, as we saw from some of our friends in Europe, where Governments were a bit more hands-on in implementing sanctions at the border.

Dr Mona Paulsen: One of the key advantages for the UK Government is their continued participation at the World Trade Organization and within other institutions, whether informal, such as the G7 and G20, or through this institution, to encourage transparency and notification through trade policy instruments and measures there.

In the way that they do that—creating an open system—the infrastructure for that sharing of information, even if it involves a security element, is available. One of the key things is to encourage and foster that kind of notification process. Where certain Governments may be hesitant, they can develop some practices to address these security concerns in the same way that they developed dealing with private-business confidential information. They have the resources and experience to do so. It would raise new challenges for security risks, but it is available.

Q30 **Lord Browne of Ladyton:** To some degree, this question has been asked, or at least it has been engaged with. The supplementary is much more interesting than the actual question. I will ask the general question first. Security has the Government and their democratic allies focused on

addressing the risks to the rules-based order currently. There is no question about that. Economic activity and security come together in sanctions, which have already been mentioned.

I am a new member of this committee, so I did not hear this evidence, but I am told that the committee previously heard evidence about the increasing risk of sanctions being got around by international trade measures and other things. How important is international co-ordination and trade for ensuring the effectiveness of sanctions and for addressing these threats to the rules-based order? To some degree, you have answered that.

Dr Mona Paulsen: I should introduce myself; I am sorry. I am from LSE Law School. This is my area of research as well. What is key here, perhaps going back to the previous panel, is to stress that trade within an open, integrated economy can lead to many benefits. In thinking about how we develop concerns with respect to economic security, we sort of need to define what economic security is.

In thinking about the way that the World Trade Organization has developed it, it is being able to handle resources and deal with shocks in a way that does not disrupt or stop trade and production. To that extent, regarding some of the discussions that were happening earlier about what a strategic good is, as we have seen, some of that is not necessarily always linked to particular inputs or materials. Sometimes something can be strategic just based on the fact that, if Government put resources into it, they will have the resources to reallocate somewhere else. Something that may not immediately seem strategic can become strategic.

The advantages of international co-ordination and of creating an open system and level playing field for Governments to agree to particular rules that benefit their producers is that, in doing so, they are trying to open up the flows to enable that kind of resource allocation to be determined by the Government as they see fit, but not to have to run into barriers.

The interesting thing with the concept of economic security today is that, after the pandemic and the Russian invasion of Ukraine, and in particular with these new concerns about technological dominance and economic competitiveness, we are seeing Governments increasingly imposing trade controls and restrictions. They are doing so unilaterally. The key here is to try to come back to thinking about whether these systems still benefit all producers.

International and multilateral co-ordination is something that the United Kingdom always believed in. The United Kingdom always believed in and championed an open system, and there are many episodes of that throughout history. The reason for that was because it allowed their producers to specialise and to be able to trade and co-ordinate in that way.

The advantage of doing so through multilateral co-ordination versus unilateral is that, if one Government impose controls, it is unclear how

the butterfly or ripple effect of that will happen. Having an open, internationally co-ordinated system has proven to be much more effective in addressing these kinds of shocks head on.

For example, some of the comments from the previous panel addressed the concerns of having only one source for one particular area. The key to that is to work together with our other allies and Governments to keep channels of trade open, to ensure that the routes of trade are open as much as possible and, further, to use resources to create diverse sources, so you can have trade diversification and benefits from that.

My concern, when I hear these concepts of friendshoring, is that it leaves certain Governments out. This is something that the WTO's Director-General once said. Many countries are very interested in participating in trade, and it is to our benefit that they wish to do so because, in having greater access to lots of different sites of resources, we can build more resilient supply chains rather than just trying to build them at home. Technological innovation happens so rapidly that at one point you think you have the resource that you need to be secure, and the next day you do not. Having an open system really benefits co-ordination. Thinking about developing economic security by having that open trade is the goal.

Of course, there are questions about what to do with potential economic adversaries and how to address that within the open system. This is where you see the clashes and the frustrations from some Governments taking unilateral action.

The key to that is to try to develop instruments within that international co-ordination that address those concerns. It may be the kinds of remedies that Dr Messenger talked about, whether through data collection or early warning mechanisms trying to anticipate shocks. A lot of it is quite simple in that you try to keep the lines of communication open. In doing so, you try to foster trade negotiations and commitments, allowing embassies to continually be on the ground talking. It is an effective way of developing the kind of resilience and economic security goals that the UK Government have.

Dr Greg Messenger: I agree with all of that. One of the curious outcomes of the system is that the leverage that you have vis-à-vis your partners is, in large part, reliant on how integrated you are with them. If you are not trading much and there is not much interlinkage, the impact of your trade measures will be limited if you want to try to get attention, encourage compliance or change behaviour.

It is telling that, quite often, as Dr Paulsen pointed out, it is not necessarily around critical sectors; it is politically sensitive sectors. When our partners want to get our attention, they hit Scotch whisky. That is the first thing that goes, because immediately there are calls to No. 10. It is a very organised lobby. That is the way you do it: you find your political weak spot.

This is one of the wider concerns, and it touches on what was raised earlier with China. The challenge is that the more and more that there is a nervousness that we might have an introduction of a large number of these sorts of measures, the more that that business prepares. You start seeing fragmented supply chains or parallel supply chains decouple, as it were. Decoupling has fallen out of fashion because everyone has realised it is impossible to do, so we now talk about derisking, but in practice we are still going along the same track.

The challenge there is that, the less that you are integrated, the less there is an incentive to use these systems, because they become less efficient at trying to encourage compliance and change behaviour. There is a real risk that, the more you go down this route, the less likely you are to be able to influence each other, exactly for that reason.

Leverage through economic power that can then be used for things like sanctions is not a new occurrence. For us, this is unusual; the boot is on the other foot. Ask any of our developing country partners, which have been dealing with this for 100 years. Those linkage issues are quite important.

Dr Mona Paulsen: The fragmentation that Dr Messenger just spoke about is very costly to firms too. If you require a firm to develop one access route through one set of friends, for example—to use that analogy—and then another supply chain through another set of friends, perhaps as a back-up, it is extremely costly, because then the firms will have to develop different sources multiple times, and have to learn about the different laws and regulations for each one of them. They will have to create a lot of duplicates, and it will be redundant in some cases, but it will have to be done just to make sure that they can access everything they need. This is why regional blocs are discouraged.

- Q31 **Sarah Atherton:** Can I ask your opinions on AI and the legal collection of anonymised bulk data for marketing purposes? Dr Messenger, this might be one for you. This is about tracking personnel, their purchasing preferences and search histories, and how that can be used in ports and military installations. That is legal data that is used for marketing but, in the wrong hands, how can it be used to disrupt activities, particularly in ports?

Dr Greg Messenger: There are certainly issues in my field around what rules we agree on. On the one hand, we want free flow of data. On the other hand, we want to recognise that we have constraints around privacy, protections and so on. This is obviously a highly contentious area. It is not an area of particular expertise, so I will defer to the others if they want to raise an issue.

There is one point on this that I would just flag. AI and tech in general is an interesting issue. On a number of these issues, we are seeing a lot of discussion around standards that underpin a lot of the practices here. Different groups are developing their standards. Traditionally, the standards come bottom up through business and what is useful.

That whole space and movement is about trying to shape standards that then shape practice and behaviour and become the way of doing things, and the way that everyone wants data to be protected and so on. That piece, which we usually refer to as regulatory diplomacy, is an area in which the UK has a disproportionately large footprint. Our national standards body, the British Standards Institution, is extremely well regarded and is very forward-looking in a number of areas. We have a lot of space, and we heard earlier about some of the movements trying to shape some of those rules and standards, because what you do not want is somebody else doing it and then you are, in effect, caught out. Regarding the malicious use of data and so on, I will defer to the others if they have anything to bring in on that.

Mark Simmonds: I will give it a go. This is still an area that we are grappling with and is an emerging issue with AI. We are talking to Government. It is one of the priorities that we are talking to them about when it comes to economic security.

Generally, when it comes to consumer goods and things like that, there is not a huge amount of visibility from ports of what is in a container or lorry coming through the port, certainly not from the port operator. There might be from government agencies. HMRC or Border Force might have a better idea of what is in there because they have the declarations and some of that data but, generally, if you are moving a box to a port, it is a box. There is not a huge amount of scope for abuse at the moment, but it is still something that we are considering as it emerges.

Dr Mona Paulsen: Questions of cybersecurity raise particular questions about needed expertise in that specific area. I know that Governments all have very differing approaches when dealing with cybersecurity. Some Governments are particularly firm on data localisation centres, and others are much more willing to have an open system.

In dealing with economic security and this particular question of the bridging of privacy and information, again, I would support national co-ordination to have that recognition and to be able to deal with as much international trade as possible, while respecting the UK Government's position on the protection of private information.

Q32 **Baroness Tyler of Enfield:** I return to some of the broader issues we were discussing a minute or two ago around international co-ordination and integration in response to Lord Browne's question. This is a very wide-ranging question I am asking, but I am interested in your opinion about how effective the UK Government have been in aligning their economic and trade policy with their broader foreign policy objectives. The context here is very much the threats that we are seeing to international stability in an ever-more conflict-ridden world, and the changing patterns of geopolitics and the power blocs.

Dr Greg Messenger: It is a key question. I would say one thing from observing the UK Government. For full disclosure, I have been seconded to the Foreign Office for four years, so this is drawing somewhat on that.

Some things work well. Cross-Whitehall co-ordination, as much as everyone complains, works much better than an awful lot of Governments.

In relation to trade, as I mentioned earlier, we had to hit the ground running. We did not have a choice. We started with 38 free trade agreements that had to be renegotiated and agreed, and then a political objective that was to agree a whole bunch of new ones as well, so that co-ordination on trade had to happen very quickly.

Security is a longer story. Depending on where it sits, there is the wider history there. In relation to a lot of these things, similarly, another part of the picture that I hope we will have time for is development policy, because that plays into that as well, having development sit in what is now FCDO. Across that, I do not see bringing it all together as a huge challenge in that sense. The Government have been making an effort to try to link these pieces together.

What we see with that is the result of what I was mentioning earlier. It is about trying to thread the needle and get a balance, recognising that we do not have the giant domestic markets that the EU, the US and China have. We do not have the giant deep pockets that the US, the EU and China have, so we cannot do those things. Frankly, we do not have the economic relationship with businesses that historically we and many others have been very uncomfortable with in Japan and Korea, which is not as competitive and open as what we would have preferred. Historically, that used to be the cause of issues.

We need our own approach, which is what we are working with. Seeing something that it engages with and is institutionally agnostic has been quite effective, to a certain degree. We will wait and see, but we see the UK really trying not to leverage free trade agreements and these other institutions because they exist, but rather saying, "These are all additional hooks, so what can we do? We can use that".

The Hiroshima declaration makes specific references to the free trade agreement that we have with Japan, all to try to build up a picture of how we can link all these pieces together. Could it be better? It definitely could, and there are areas where we can see some greater links but, in general terms, I do not see huge issues for co-ordination on that front.

I will just finish with one small thing, which is a risk that I fear. The UK has always traditionally been a supporter of the rules-based international order. We have traditionally been disproportionately influential in shaping rules and so on, and having things like judges in international tribunals. How do you deal with non-compliance in a system like the trade system, especially, which currently faces problems of trying to secure compliance because of problems in dispute settlement? This touches on what Dr Paulsen was saying. Do you then say, "Just blow it. We'll go alone". That undermines us as a middle power. That is the biggest risk at the moment, but I see quite positive signs with co-ordination, although with room for improvement as always.

Dr Mona Paulsen: When thinking about risks and derisking, the question to begin with is about what our end goals are. We can then work backwards and think about what means best serve those ends. To that extent, in appreciating the benefits of economic globalisation, the question becomes about whether the UK Government's goal is to derisk with respect to technological advancement. In that case, then you can see that the goal is to invest in research and technology. Is the goal to address potential technology transfer leakage problems? In that case, that is a separate issue that has to be done. If the question is about addressing economic coercion and the influencing power of a Government using trade actions or certain policy or trade instruments to influence behaviour on behalf of the UK Government, that also requires a different response.

Weaponising trade is something that has come up, but it is largely a discussion of weaponised interdependence. Two political scientists in the United States, Henry Farrell and Abe Newman, are the key for thinking about that logic. This is that idea of thinking about the global economic system like a network, considering your ability to control chokepoints and influence behaviour and supply of that need. This is where that idea of decoupling first came from. It is that idea of, "All right. We will reroute or bypass around that problem to avoid it, so that we do not have that chokepoint or that influence".

With respect to the alignment of UK policy and foreign policy goals, each of those requires different instruments. I can talk to you about what some of the other Governments have done, but in broad terms what is really important to understand is that the Governments have not adopted a single policy. It is about highly multifaceted interdependence.

For example, the United States is not only throwing heavy investments into the development of advanced semiconductors. That is coupled with very detailed investment screening mechanisms, both inbound and outbound. There are internal regulations that encourage displacement of particular suppliers in preference to others. It involves thinking about visas for students and about immigration. They are highly interdependent.

It is a question of evaluating the costs and benefits of what the UK Government want to do. Is it to develop the developmental mindset that some other Governments in the past have adopted, where it is heavily bureaucratic and the state determines which industries or sectors receive funding, or is it one where the UK Government focus on efficiency, allowing industries and businesses to allow supply and demand to flow freely? These are the kinds of trade-offs that come into dealing with this question.

Definitely, to be clear, these are heavily multifaceted strategies. When we are talking about other Governments' economic security strategies, it is not a single measure, subsidy or financial contribution; they are very integrated.

Mark Simmonds: This is slightly outside of my wheelhouse. I will just agree with what Dr Messenger said about the Government being very good at standing up structures rapidly when there are security issues or crises. That has very much been our experience. They have been very good at communicating quickly with industry on some of those things—not so much day to day but, when there is a crisis, they are very good at it.

Q33 **Lord Sarfraz:** How effectively have the Government engaged with your members and you, specifically on the topic of protecting economic security?

Mark Simmonds: As I just mentioned, the Government have been very good at talking, certainly to us. When it comes to economic security, we sit on a public-private forum to talk about exactly that. Of course, economic security covers such a broad range of things. We are also engaged on a number of what I would call subtopics on anything from cybersecurity to adapting to climate change and the impacts that has on ports and other bits of critical infrastructure. Generally, they are very good at ministerial level all the way down.

Lord Sarfraz: Are there any comments on that from other industries? Have you seen the Government reaching out enough practically to industry on the topic of economic security?

Dr Mona Paulsen: I have no comment on that.

Dr Greg Messenger: I have nothing specific to add. I just have one small point, which is something I mentioned earlier. There are multipliers of benefits in a lot of this. There is the sort of work that takes place, for example, when businesses say, “We have a problem with a market access barrier in X country”. The process for trying to deal with that is the same process for, “That is odd; China has suddenly started checking everything from Lithuania after it recognised a Taiwan representative office. It did not say that is why, but everything has stopped going in”.

How do you know when it is an economic security issue or a traditional trade policy issue? Regarding the systems in place and those processes, if you are really good at one, you are really good at the other. It is good to hear that those sorts of engagements take place, but they should not be just for economic security purposes; they should be because they are very useful things to do anyway.

Dr Mona Paulsen: These questions about economic competitiveness and foreign policy are very difficult to identify and separate. What we might identify as trade protectionism versus economic competitiveness, or a foreign security or national security concern, can be really difficult to navigate. Obviously, if a Government declare that it is a national security issue, it has to be addressed very delicately, and then firms are challenged—this is something that we talked about at the beginning—in what they can do when it comes to national security. This is one area

where it would be really beneficial to try to develop international co-ordination on where that line leads.

I always explain to my students that the line between something that is a security concern and something that is just about economic competitiveness is a huge vast gap of ambiguity. There is this wasteland where we cannot tell what is what, so coming up with clearer rules of how to navigate that would be very beneficial to firms, because they would have a greater understanding of how to delineate the two. Now, in today's economic security situation, we need to be much more conscious of that than we were in 1947, when the understanding of security was quite different.

Q34 Baroness Crawley: One of the things that has come through today is that ports have become more and more important. Some 95% of the volume of trade in the world is by sea. In the difficult times we live in, does our representative, Mark Simmonds, from the British Ports Association, believe that the Government are supporting ports? Does he believe that the Government recognise the importance of ports? Is he aware of the work that is being done at the University of Plymouth on the vulnerability of British ports as far as cyber and GPS manipulation is concerned? The days when we felt that ports are completely safe are gone. What can best be done to support UK ports?

Mark Simmonds: Ports have always been important. That is what I would start with. There is a lot to unpack. Yes, broadly the Government recognise the importance of ports. I should probably say that we would like them to recognise them more on a daily basis.

I am not aware of that specific research you mentioned, but we do talk to the Government a lot about cybersecurity. I have always said that the work that the Government have done on cybersecurity with the ports industry is a template for how they should engage with us on all sorts of other issues, particularly environmental, because it is an area that we find tends to be better resourced than other bits of government. It tends to have people who know what they are talking about, there are enough of them and you can get hold of them.

On the implementation of the NIS directive back in 2018, which regulates the quality of cybersecurity among our critical infrastructure, including ports, the approach was exactly what we would have liked to have seen, in that the Government talked to us as partners and to the major ports that were in scope of that regulation. They had an honest conversation about where they were and where they needed to be, and then they worked with us to make sure that those ports got to that place. If you did not comply with that or if you did not go along with that approach, then you would get walloped by the consequences, but everyone did, and that was a template for how we would like to see engagement.

There is a broader point about one thing we would like to see the Government do better with ports. You mentioned the 95% of international trade that comes through ports. That is often well

recognised by Government. There is an emerging recognition that ports are also going to be important to our energy transition. We are probably going to need 10 or 11 new or completely transformed ports in the very near future to meet our offshore wind ambitions. Some of the new floating offshore turbines especially are going to need very specialised, very expensive infrastructure. The planning system and the way we have traditionally done things in building and expanding port capacity needs to change very quickly. There are definitely some things that the Government need to do around that, supporting our energy and wider economic security there.

There are so many areas that I could cover. On climate adaptation, we are doing okay. Again, we have a good relationship with the Government. It is one of the things I touched on before. The Government are very good at dealing with immediate short-term crises, but looking at those longer-term, 20 to 30-year challenges, such as adapting to climate change—where we are going to see rising sea levels, regardless of what we do on emissions—it is a bit harder. It is a bit more difficult to get exactly what we need out of the Government.

Broadly, certainly on cybersecurity, the relationship is very good. We find that the Government tend to have more resources and very highly qualified people to support us, and they are quite responsive. We are broadly pleased with how things are going there, although perhaps not so much in other areas at the moment, particularly around planning, energy and other things that we need.

The Chair: Thank you very much indeed, all three of you. Thank you for your patience; I am sorry we kept you waiting for a little while. The committee has found it a useful and constructive session.