

# Joint Committee on the National Security Strategy

## Oral evidence: Global supply chains

Monday 13 June 2022

4.30 pm

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Members present: Margaret Beckett MP (The Chair); Baroness Anelay of St Johns; Sarah Champion MP; Baroness Crawley; Lord Dannett; Tobias Ellwood MP; Baroness Hodgson of Abinger; Darren Jones MP; Angus Brendan MacNeil MP; Baroness Neville-Jones; Viscount Stansgate; Lord Strasburger; Tom Tugendhat.

Evidence Session No. 5

Heard in Public

Questions 63 - 77

### Witnesses

[I](#): Professor Tim Benton, Research Director, Emerging Risks, and Director, Environment and Society Programme, Chatham House; Professor Lenny Koh, Cross-Cutting Chief, Supply Chain Resource Sustainability (SCRS), University of Sheffield; Rear Admiral (retd) Professor Neil Morisetti, Vice-Dean (Public Policy), Faculty of Engineering Sciences, UCL.

### Examination of Witnesses

Professor Tim Benton, Professor Lenny Koh and Professor Neil Morisetti.

Q63 **The Chair:** Can I welcome all three of you? I hope you are aware that Professor Koh is virtual but with us, as are, indeed, some members of the committee. Thank you very much, all three of you, for coming to give evidence to us today. We propose to divide the evidence session into two parts, both focusing on global supply chains, but first looking at the impact of climate change on supply chains, because that is part of our inquiry into critical national infrastructure and adaptation to climate change. Then we will move on, slightly separately, to a series of questions about the impact of the Ukraine conflict, in particular on food security. We have a lot to cover in that case, so I would be grateful if all three of you could make your answers as focused as you can, bearing in mind, as I say, that some members of the committee are present virtually rather than in person.

I will ask the first question, which is to each of you. What do you see as the main impacts of climate change on global food supply at the present time?

**Professor Tim Benton:** At the present time, we have an increase in extreme weather of various sorts—drought in the Midwest and Argentina, heavy rains over the winter in various places. Arguably, Covid was made more likely by a combination of climate change and land use change, or one or other of those. You have pests and diseases, with locust outbreaks over the last two or three years in the Horn of Africa and parts of Asia. You have extreme heat also affecting workers' health in some parts of the world. It is quite profound already, of course.

**Professor Neil Morisetti:** As you get rising temperatures, you get reduced yield in many crops, not just from extreme weather events. For example, a 1 degree centigrade rise in overnight temperature is a 10% drop in rice yields, which is particularly pertinent in agrarian countries in Asia, such as Bangladesh.

**Professor Lenny Koh:** Thank you for inviting me to join this session. I would like to refer to the IPCC report, the AR6, that was launched last year. Human activity is the main cause of big climate change consequences, as a result of which we are experiencing impacts, not just in individual nations and organisations, but across the globe and across the global supply chain. In particular, we have a key responsibility to maintain the security and stability of critical national infrastructure, and, in the longer term, to ensure its resilience and safety.

In regard to the scope of the activities and the session today, it has a lot to do with how we can improve our resilience and our security to ensure that our food supply chain can withstand this sort of shock externally and any potential climate change that would have an impact on it.

Q64 **The Chair:** Having asked you all what you see as the position now, perhaps I could also ask you, then, to turn your attention to what you think are the most likely effects on food supply over the next five, 20 and 50 years.

**Professor Tim Benton:** That is a really difficult question to answer, because a lot of the consequences of climate change will be filtered through our investments in how we deal with adaptation and so on. I have just finished a project in sub-Saharan Africa, and one of the interesting things there was that, under bigger climate risks, yield was likely to increase because Governments were more likely to invest in irrigation methods, water storage and things like that to reduce the impact of climate change.

We have to differentiate between the risk from the hazards and societal response to that. If society does not respond, things will get a lot worse, but, over the next five years, we are likely to see much more of the sorts of weather we have seen in the last two or three years, particularly Pacific heat domes and droughts.

If you look 10 to 15 years ahead, more critical things might happen. We might get larger-scale changes in distributions of weather events, with long-term issues such as the slowing down of oceanic currents and more blocking patterns. If you look far enough ahead, with the speed with which we are not decarbonising, the world gets into such a high level of volatility that it becomes, from my perspective, quite scary.

**Professor Neil Morisetti:** Yes, and we have 30 years locked into the system, irrespective of whether we carry on emitting now. You have a growth of the sort of challenges we have been describing. As you get those persistent challenges, you start to get a breakdown in society as well because you start to see areas that are continuously affected by extreme weather events, loss of crops, loss of food supplies. Their society starts to erode and then you start to get into a position where you have a contributing factor to instability around the world and the risk of conflict.

**Professor Lenny Koh:** In the short term, so the next five years, it will impact across the 13 sectors within the critical national infrastructure and their supply chains. For instance, we will experience, as we are already experiencing, resource scarcity and shortages of critical materials and minerals, food, key commodities and energy supply. This risk of supply chain vulnerability will impact on availability of infrastructure as a result of flooding, fire events and so on.

In addition to this, it will stimulate global supply chain and economy restructuring because, as a response against the impact, many policymakers will probably consider what we can do to address these risks in the supply chain. One of the notions is the idea of potentially deglobalising the supply chain to make it more national and more localised, so that we reduce the reliance on external supply, thereby potentially reducing the impact on the local supply chain. There are of course many other impacts across the systems.

Q65 **Mr Tobias Ellwood:** When you consider authoritarianism versus democracies and open states, looking at the map of where climate change is likely to affect, it does seem that more authoritarian states will be hit than perhaps western-leaning states. Could you say whether there will be an impact on the kind of governance? You said there could be a breakdown in society. What does this do to dictators wanting to hold on to power or, indeed, others seeking to secure power in countries where food security will become an ever-increasing issue?

**Professor Neil Morisetti:** It is more than just whether it is authoritarian or democratic government. The reality, as you pointed out, is that climate change is having its greatest effect on the most vulnerable parts of the world, in countries where we already have problems of food, health, water, demographics, weak governance, and weak capacity and resilience.

Whether it is a dictatorship that someone else tries to impose their dictatorship on or whether it is a country that may have a fledgling democracy but is struggling because of the challenges that have been

posed by a changing climate, that is increasing the risk of instability in those regions. Because of the routes that supply chains take, they tend to pass through or close to those regions, which again increases the risk.

**Professor Tim Benton:** One of the key things I would like to emphasise in this session is that it is not where the hazard happens that the biggest risks are. As we are seeing at the moment, we have hazards happening over in Ukraine, but everybody in the world is feeling the cost of living increase, so it is not where the climate impacts hit the ground; it is the supply chain, it is the impact on people movement, financial flows, and all the other things that can cross borders and lead to some of the destabilisation of government-type of things that Neil was talking about.

**Professor Lenny Koh:** Absolutely, and supply chains are very interdependent on the global supply network and the global demand network, so there are primary impacts as well as secondary impacts, direct and indirect, in this sense.

Q66 **Angus Brendan MacNeil:** Professor Morisetti, you probably touched a little on this. You just brushed past it earlier in your response to the Chair. Looking at the secondary impacts, you mentioned conflict, but they are also on migration, efforts to eradicate poverty, and child labour. What would you highlight that is less obvious to people but could be arising as a result of these changes?

**Professor Neil Morisetti:** If you look at the second and third-order consequences of a changing climate—loss of land, loss of livelihood because of the rising sea levels, increased temperatures et cetera—we talk a lot about people who move and migration, but, actually, the majority of migration is intra-state. Only about 10% moves beyond state boundaries. We do not necessarily look so much at those who cannot move, the really vulnerable ones, who do not have an alternative choice but still require to eat and some form of livelihood.

There is increasing evidence that regions such as the Sahel are susceptible to becoming engaged in, at best, illegal activity and crime, but also to being recruited by the likes of Boko Haram, AQ and other non-state actors and violent extremist organisations, which is furthering the instability in those regions. As a result, there is a knock-on effect, as Tim was saying, because it is not necessarily just in the region. Once you have instability, you start to get volatility in prices, energy and other areas.

**Angus Brendan MacNeil:** I am also chair of the International Trade Committee. We are currently looking at the Australia trade agreement, but it applies to New Zealand and other places that the UK is looking at. I have asked the question of negotiators and have been quite surprised by the answer that there has been no thought given to food security in these agreements.

Now, the immediate concern of the farmers is probably an obvious one. There is probably no major change, in that there is enough of a market

for Australian goods. However, if there is a demand shock from somewhere like China, they could flood the UK market for, say, five years, destabilise farming here, then re-establish their own markets and undermine what one of the witnesses mentioned earlier, the closer production capacity.

Do you find it a concern or a surprise that the UK is currently negotiating trade agreements with no thought at all to food security? Do you think something should change and, if so, what?

**Professor Neil Morisetti:** There is a growing awareness of issues with food security, but I do not think there is yet an understanding of the interrelationship of all the factors that determine food security. You may have described some of them. There are others.

There is no understanding yet of how you build a picture of the challenges and, from that, determine what your strategy and policy will be so that you become an intelligent user of that picture, bringing together a community that can understand what is happening in the way of food availability, whether it is food imbalance or food scarcity, and then make judgment calls.

It is not yet up there in the list of priorities that we should be looking at. We saw it with Ukraine, where the focus is immediately on oil and gas. That was the immediacy. In reality, probably the food security issue is a bigger global challenge and is likely to create greater insecurity than the oil and gas issue.

**Angus Brendan MacNeil:** So would you make a plea that food security at least becomes part of the thinking of any trade agreement negotiations that the UK is doing?

**Professor Neil Morisetti:** It has to feature in trade agreements. It has to feature in national security strategies. We have to acknowledge that it is a more complex environment, with many more factors that determine our prosperity and well-being, and we need to give consideration to all, rather than being selective.

**Angus Brendan MacNeil:** Professor Koh, you mentioned the shorter supply chain and the more local production. You could argue, on the other hand, that it would increase costs, because you would not perhaps have the most efficient areas producing things, but you would increase security. I would be interested in your comments on the point about the trade agreements being conducted in a vacuum, completely ignoring or oblivious to food security, in fact.

**Professor Lenny Koh:** It is very interesting that you bring up the food security point, because the food strategy has been released today by the Government. I hope everybody has a chance to read it and reflect on it. It is an ongoing piece of strategy and work. More needs to be done and ongoing consultations will be required as a result of the initial stage of the report that has been released today.

The point about trade agreements is crucial. Energy security, food security and, in fact, all the 13 sectors across CNI would need to be considered carefully. Research, innovation and technology are needed to support these sort of activities as well.

In addition to this, the supply chain resilience piece will play an important role as part of the trade negotiation going forward, because trade is about international trading of imports and exports. In order to reduce our reliance on imports or reduce the export deficit, we need to think, "What can we export? What can we import? What is the nature of the specific supply chain for those particular sectors in the short and longer term? What would be the impact of climate change?", and so on. It is crucial.

On the point about child labour, this is very important. This is a dimension of social responsibility for any organisation or decision-maker. Increasingly, there is already a recognition from private sector industry of the idea of ESG requirements for investors, so the point about ESG, child labour, et cetera, would need to be part of that parcel as well.

**Angus Brendan MacNeil:** Professor Benton, on the scenario that I was painting, which has not been considered, of a displacement activity where an economic occurrence happens in which Australia and New Zealand farming damages farming in this hemisphere, in the UK, then reorients itself, given the distances and the supply by ship, I am just interested in any further comments that you might have.

**Professor Tim Benton:** I am struggling a bit to understand the premise of the question, but the reality is that, over the last 15 years, we have had the 2007-08 food price spike, the 2007-20 global financial crash, and the 2010-11 food price spike. We have had trade wars.

We have had the Arab spring, which was caused partly by the 2010-11 food price spike, destabilisation in the Middle East, and the rise in immigration that came from that. We have had that messy exit from Afghanistan. We have had the pandemic, and now we have the war. We are living in permanent disruption. The idea that we will go back to some sort of stability and normality makes no sense at all, particularly with the rate at which we are not dealing with climate change.

We then have the issue: what is our food security? Our food security is partly to do with what we grow at home and partly to do with what we import. You can see a whole range of things that will influence the balance of the strategy about how we should do it.

The sum total of what we import is necessary to make up for what we do not grow at home. It is not so much a trade relationship with a country, a trade relationship with another country and a trade relationship with yet another country. Things will happen and there will be volatility in the system, and we want to make sure that the sum of those trade relationships allows us to meet our needs at the time that we need to.

It is not a matter of whether we can fulfil our supply chains, but whether we can do so at a price that people can afford. That is to do not just with the price of the imports, but with the cost of living and wages. It is also to do with stability and various other factors around the world, input costs and so on.

It is not simply that a country with which we have a trading relationship might undercut us. There is that potential, and I am surprised that there was nothing about that within today's national food strategy, because we really need to think about the totality of our trade relationships as well as the individual trade relationships and the synergy between what we grow at home, how we govern what we grow at home, what we import and, I guess, what we export.

**Angus Brendan MacNeil:** Just to clarify, the point of the question is that agriculture can be used as a bargaining chip by the UK for services access into the southern hemisphere, but no consideration is given to farming for a food security angle. I was just wondering whether you feel that, in the negotiations, food should be thought of as food rather than as a pawn for access to be traded away.

**Professor Tim Benton:** That is absolutely correct. We should be thinking about security in the sense of security of food, not just maintaining the supply of things that we perhaps do not need. We want to think about it from a critical perspective, and that includes price, year-to-year variability, and whether, if we take a bet on a country, it will be able to fulfil that bet one year in three, two years in three or three years in three. That should all be part and parcel of the thinking about who we should be targeting for bilateral trade relationships.

Q67 **Baroness Hodgson of Abinger:** Following on from your comments about the sum of trade relationships, have multilateral organisations such as the UN been effective at addressing the impact of climate change on food supply, and what more should they and other organisations like that be doing? Should they be giving more consideration to the fact that the majority of people, two-thirds of the world's population, live in the northern hemisphere and the yields of food there?

**Professor Tim Benton:** Two-thirds of the world's population live in the northern hemisphere. Yes, I guess that is true. I am sure Neil will have a cogent view, as he always does.

The UN is a collection of countries, and the lack of activity collectively by the UN on climate change reflects the lack of activity that individual nation states, the sovereigns, put in place. But it is very clear, and of course Ukraine emphasises it again, that for the last decade or two the multilateral international architecture of co-operation has been eroded and undercut. It is nowhere near as strong as it needs to be.

We do not have a co-operative world any more. We might want to have a co-operative world, but we do not. When it comes to dealing with the

challenges of things such as climate change, it will be much more difficult in a world that is much more competitive.

On the WTO, the lack of real ambition to deal with the externalities associated with trade is huge. Everybody acknowledges it a certain extent, but the mantra that we have to remove any barriers to trade, and anything environment can be seen as a barrier to trade, means that we are just digging ourselves into the grave very much more quickly, because we are not tackling this in the right way. We cannot leave everything to the market, because the market will not deal with the scale of the challenge we have ahead of us.

**Professor Neil Morisetti:** Yes, the UN is the member states, at the end of the day. It is up to the nations to act and, frequently, nations act in their self-interest. But perhaps the bigger challenge, which is not unique to addressing climate change, food shortages or food security, is that these are what I would describe as strategic issues. They need long-term commitment and engagement, and we live in a short-term, tactical world where the immediacies of today and the day after are a higher priority. That presents a challenge for national Governments in their engagement in these issues.

**Baroness Hodgson of Abinger:** Can I just pick up on one thing in that? Do you feel that our type of democracy, with five-year Parliaments, plays against that?

**Professor Neil Morisetti:** We are incredibly lucky to have a five-year Parliament, but when you have a two-year cycle, of which 18 months is spent campaigning for the next two-year cycle, it is quite hard to get decisions. Then you have nations that are authoritarian and will do what they want to do, but one of their functions is to keep their citizens happy so that they can stay in power.

There is perhaps a tendency not to focus on the big picture—the long-term strategic picture. I am afraid that, in my mind, until we start to address the big picture we will struggle in all these issues and many other 21st century challenges.

**Professor Lenny Koh:** The UN is supposed to be an independent international organisation, so it is vital that it plays a key role on this strategic issue internationally to ensure supply chain security. It carried out some really good work in the area of environmental protection, for instance, through UNEP, tackling the issues of climate change, but in the area of supply chains it is rather limited, in my opinion.

More can be done by the UN in this regard. For instance, perhaps a UN-type organisation can be set up to focus on steering supply chain security and resilience globally. That will be helpful in order to address the short-term issues.

Q68 **Sarah Champion:** I wonder whether I could take Professor Koh back to her comment about child labour. We know that 100 million more people

have gone into extreme poverty in the last two years because of Covid and climate change. Women and girls seem to be the most adversely affected on that. Could you say a bit about whether that is true and why, in global food chain terms, that should be a consideration and concern for all of us?

**Professor Lenny Koh:** Child labour happens in countries where regulations and policies for this sort of social area are more relaxed and there is less compliance with regard to recruitment, employment, et cetera. At the same time, there are practical, pragmatic needs—or not needs—such as providing, in a sense, a job and a type of security of income for the child locally. Because of the poverty that they are facing, it is a way forward for them, in their perception.

Overall, as you have mentioned, this is not sustainable. It does not comply with the international sustainable development goals, for instance, and what we believe in as part of an international organisation—ensuring sustainability, rights for women and children, that their health is protected and they are not being exploited, and so on. The social dimension is really important in this area. That needs to be picked up by industry practices across the supply chain.

**Professor Tim Benton:** Coming out of the first bit of Covid, where everybody was in a bit of a panic, we did some work at Chatham House. Under Chatham House rules I will not give any details, but somebody from a major food company said that they were aware that, while everybody was scrabbling around for contracts to fulfil the need for food in the UK, their due diligence for what was going on in the global south was given a bit of a backseat.

Part of the issue with the crises and the extreme price pressure on things is that corners get cut. As well as the local incentives for people to be exploited in marginalised situations, we are sometimes scrabbling around too much, such that shortcuts are taken and we are not as squeaky clean as we would like to be.

Q69 **Viscount Stansgate:** Professor Benton, how resilient is the UK's domestic food supply to the effects of climate change, given that in the years ahead we will have more frequent periods of extreme weather?

**Professor Tim Benton:** It is difficult to say what our food supply is, because our agricultural production is not the same as our food supply. At the moment, we grow pigs, we export a lot of pigs, and we import some cheaper pig meat to make into pork pies and so on. It is slightly up in the air what our food supply is.

I first wrote a report for John Beddington when he was Chief Scientific Adviser in, I think, 2012, looking at climate change and UK food system resilience. The conclusion from that is that our biggest risks are overseas and cascading risks, not so much on UK production volatility, mainly because we do not eat as much of what we produce as we import, if you can follow the logic of that.

We produce a lot of stuff. We feed quite a lot of what we produce to cattle and livestock. We export quite a lot, but, if you go into a supermarket and see what people are buying to eat in the evening, it is often packaged food, which has very long supply chains, is rather low in local ingredients and so on. I know our local agriculture is quite fragile in many ways, but I do not think the risks to our food security are directly related to whether we have an East Anglian drought.

**Viscount Stansgate:** As I understand it, we had a poor harvest in 2020 and it recovered a bit the following year. Are there sufficient contingencies in place to cope with a scenario like that, and how many years of a 2020-type outcome could we withstand without having to take stronger and more extreme measures in order to provide us with the food that the UK needs?

**Professor Tim Benton:** Every five or six years, the UK does a climate change risk assessment, and I have helped with the last two rounds of that. The one we did that was published in, I think, 2016 raised some of these issues quite vocally, and government's response at the time was to say, "We'll invest in sustainable intensification and the rest is down to the market". It has been axiomatic in this space that it does not really matter what happens, because the market will solve it. If we have a shortfall in the UK, we just import more.

Now, I have been arguing for a decade at least that that is a very dangerous view to take because, as we have seen this year, we might have bad weather in various places. We might have supply chain interruptions. We are not going to, but if we had a very significant heat effect in the UK, we would not necessarily be able to import it, because it would be very expensive and we would not necessarily be growing stuff at home.

We should be doing much more. This is why I am particularly disappointed with the national food strategy published today, in that it does not cover food security in any meaningful sense, in the way that you mean it.

**Viscount Stansgate:** Your view, from what you know so far of the document released today, is that it continues to rely on the market to solve problems as and when they arise.

**Professor Tim Benton:** Yes.

Q70 **Baroness Crawley:** Perhaps, Professor Benton, you could say a little more about your criticism of the new UK food strategy announced today. Government announced £270 million of investment into the UK food industry. Although it has been much leaked, it has only just come out, so we do not expect you to have reviewed it very deeply, but what do you think the Government should have done, and where should the bulk of that investment be going, as far as you are concerned?

**Professor Tim Benton:** We have a food system that is not working. It is undermining health and driving mortality in the UK. It is undermining the

environment. We are not managing our biodiversity. It is contributing to greenhouse gases and is very fragile to the sorts of events that we are seeing at the moment.

To have a comprehensive food strategy requires us to tackle resilience, health and inequality. It requires us to tackle climate change and build resilience, but also mitigation, which might require dietary change, as Henry Dimbleby said. It requires us to take into account a land use strategy for net-zero transformation, et cetera.

There are so many bits of it that should be interlocked, yet we have 27 pages, which is largely aspirational, about the future. I think it tackles directly one of Henry Dimbleby's 12 recommendations. It does not get to the roots of making our food system more resilient, more sustainable, better from a health perspective and economically viable.

**Baroness Crawley:** Given what you say and—I do not want to put words into your mouth—your view that this strategy is a lost opportunity, where can we look beyond the UK for best practice? What countries are doing it well at the moment and have the focus of their investment going into the right place?

**Professor Tim Benton:** No country is doing it well enough, partly for reasons that we were talking about a minute or two ago. The food that a nation eats is partly trade and partly local production, and getting those two things right is difficult. You can change your farming practice and make your local food more expensive, but then undercut everything by cheap imports and so on. You have to find a way to navigate the structure of the market to make sure that you are not disadvantaging farmers or citizens.

Various countries are leading on a whole range of things. We lost the opportunity in the UN Food Systems Summit last year. COP 26 did not firmly tackle food systems in Glasgow last year. It is higher up the agenda for Egypt and will be higher up the agenda for UAE. Various countries are driving much more integration of health and nutrition into their markets, but what it really needs is structural change in the incentives in the market.

We need change in what is grown, how it is grown, where we trade with, how it is processed, how it is sold, the incentives for getting the price right, reducing the environmental externalities, reducing the healthcare externalities, and so on. It is not just something that you can tweak at the edges and hope that the market will solve, because it will not.

**Professor Neil Morisetti:** If I can take off my UCL professor's hat and put my Dorset farmer's hat on, I have only skimmed the strategy, but the bit I am worried about is lack of certainty, in the sense of prices. My colleagues and I are all farming small farms in north Dorset. We are on the sustainable farming incentive pilot. We would just rather have some certainty in prices and realistic prices, and have some certainty of labour.

It is challenging to say that we will grow the same with what is being proposed at the moment. We accept, with the sustainable farming incentive, that we have a reduced yield. That happens, so the alternative is an intensity that will further damage the soil and cause other issues, which will come home to roost in the long term. There are a number of areas where it does not quite—as I say, I have only skimmed it—add up to generating what the Government were hoping for when they put it together.

**Professor Lenny Koh:** There are some good bits coming out from the strategy as well, not just bad, so we need to take a balanced view of what needs to be done further.

Q71 **Darren Jones:** Professor Benton, you said earlier that the Government's hope is that the market will fix all the problems. I understand from the most recent climate change risk assessment that 61 risks to business have been identified, from supply chain disruption and risks to international trade routes. Is there any evidence that business has looked at those 61 risks and started to prepare?

**Professor Tim Benton:** There is some in the sense that, as companies are really starting to grapple with supply chain issues, they are changing their view as to how much it becomes a strategic issue, but they are not grappling with it enough.

If we take the view that a black swan event—a very rare and high-impact event—is a one-in-1,000 event, and we think about what could impinge on UK food security, I can probably think of 1,000 ways, from droughts here, wildfires there, Mississippi drying up so you cannot get the grain out, port infrastructure, new diseases, human impacts, supply chain disruptions in terms of centralisation and so on. A one-in-1,000 event will happen somewhere out of all those 1,000 things. Although you cannot predict what will happen, you know something will happen from a systemic perspective.

When it comes down to a business, I think this is still the overall view: "If it's bad enough, it's a problem for government. If it's not bad enough, we'll cope with it". We are dealing with normal risks, but when we see something new and unprecedented, and the system breaks down, we look to government to waive rules, to give us financial support or whatever.

There is a gap in that reality between what the market takes as normal market functioning and what the Government take on board as the crisis moment, because as we go forwards, of course, we will hit unprecedented issues year after year. Business is waking up to it, but there is still a reality gap between what business is willing to pay for and what government is expecting business to pay for.

Therefore, we have government not doing enough and business not doing enough. The world is changing, we have a fragile system and we are

hitting it with an ever-bigger hammer, and then we get surprised when it breaks.

**Darren Jones:** The Government think businesses will deal with it, and the businesses think the Government will deal with it.

**Professor Neil Morisetti:** If I could illustrate that, I had a discussion a few years ago with major energy companies about their supply chains, principally oil and gas but not exclusively, and the routes they took. We were asking them where they considered to be the most vulnerable places and what they would do about it. They would talk about various things: what is emerging in the high north, extreme weather in the South China Sea and so on.

At the end of the conversation we asked, "None of you have mentioned the Red Sea—the Strait of Bab-el-Mandeb", which is a very narrow chokepoint, and if you want to disrupt trade there is probably no better place, if you have a conflict in Yemen and a conflict on the other side of the channel. This was the assumption: "That's all right. The Government will deal with that. We assumed you would. It's a big enough problem".

**Darren Jones:** Professor Morisetti, from the Government's perspective, they have done this assessment. They have identified 61 risks. What then happens inside government? Do they just put the risks on the shelf or do they do something with it?

**Professor Neil Morisetti:** I am not sure I can really comment, partly because I am out of date. It is eight years or so since I left government. It goes back to the big picture of all the other issues that are pressing and potentially causing risk, does it not? Where does it sit in the priority list? There is an issue of immediacy there.

On the assumption that it is in there, it needs to be looked at and be factored into the thinking about what actions you will take to reduce or mitigate those risks, particularly those in the tails, and then who is most appropriate to do that.

Of course, you come across another challenge, in that most of the challenges we are facing in this century are not the responsibility of a single government department or area of a government department. They are cross-cutting, but they are also cross-cutting with civil society, with business, as we talked about, and with non-government organisations, and that is quite complex. Who will direct and ensure that this happens or at the very least co-ordinate that activity? That is one of the challenges in these areas that we are facing.

**Darren Jones:** Professor Benton, do you know what happens with them?

**Professor Tim Benton:** I have done two of them. We did the chapter on international risks in the first one and there was no obvious risk owner. The CCRA is largely done for the national adaptation programme, which, until recently, has been focusing on flood defences and so on. International risks seemed too amorphous, really, to engage.

I have been involved in some discussions with the national adaptation programme team, and they are now much more on the ball about trying to identify and get on board the range of government departments that should be owning this risk. Although food security is Defra, it is of course not just Defra. It is partly DIT, partly food standards, partly the Department of Health and Social Care. That was the point of Henry Dimbleby doing this big food strategy—to join up all the dots.

The CCRA gives a list of independent risks to government, but it is very different from the Cabinet Office-owned risk register. I am not sure of the extent to which those two talk to or map on to each other.

**Professor Lenny Koh:** It depends on the specific types of risks in that list. Some could be owned by the Government or groups of departments, and others could be led and localised by industry and by organisations, depending on the severity of the risk, the risk appetite of an organisation, how well the risk management strategy, mechanism and toolsets are in place in a particular industry and so on. This is not just about food security or the food supply chain but about all types of supply chain across different sectors.

To quote a particular example, I have been working with Rolls-Royce, which is a leader in organisational and supply chain resilience across its four businesses, and an excellent pioneer in setting industry direction on managing risks and resilience. This strong capability embeds the understanding about business continuity, and risk and resilience, in its risk appetite and management. This is very important to safeguard critical resources availability, resilience and sustainability, ranging from security in critical materials supply in the supply chain up stream for manufacturing, to testing facilities for maintenance and services.

We are talking not just about responding to risks that happen right now, in the short term, but about in combination with the external environment, such as the war, climate change, Covid-19 and Brexit, especially when four of these external, big events are happening at the same time. This is a perfect storm. They are happening right now, when we have to balance our economy to maintain sustainable growth.

We do not want to plunge it into a recession again and we do not want any lockdowns. At the same time, we want to address all these risks that happen by learning the lessons from Covid-19 and so on. This combination of factors needs to be considered.

**Darren Jones:** Professor Koh, we have talked a lot about food. We have mentioned energy. Are there any other sectors from your work that you are particularly worried about in terms of supply chain resilience for the UK?

**Professor Lenny Koh:** Yes, there are certain industries and supply chains that are more susceptible to risk and resilience issues, which definitely need a closer look and management. This includes, in addition to food, energy, but particularly in the areas where we are very strong,

such as civil nuclear, renewable et cetera. They are part of the CNI priority sectors anyway. All these need to be taken into consideration; these are just some of the examples.

- Q72 **The Chair:** Is there a forum where business and government can get together to discuss these kind of risks? I think it was you, Professor Benton, who mentioned black swan events. Is there a forum where you would expect business and government to discuss those things?

**Professor Tim Benton:** I cannot think of one. It tends to be that something happens and then people get together, as opposed to there being a proactive identification of where the black swans might hit. Neil might talk to this. Foreign Office does periodic horizon scanning et cetera, but I do not think there is anything.

Following us publishing at Chatham House a climate change risk assessment, separate to the UK's climate change risk assessment, for heads of state for COP 26, I would like to see, every year, somebody look and say, "Where is the dashboard of risks?", put it together in a nice, easily accessible form and be able to say, "You should really be looking at this part of the world next year and this part of the world the year after", or whatever.

**Professor Neil Morisetti:** The likes of the Development, Concepts and Doctrine Centre, in Defence, at Shrivenham; the Foreign Office, to an extent; and the Government Office for Science are now better in their horizon scanning at drawing in a wider group of experts and users to build an understanding. What I do not know is how well and how regularly it is used subsequently to keep abreast of what is happening and of any changes.

**Professor Lenny Koh:** An excellent outcome from the evidence-gathering process would be a recommendation for some sort of resilience council for global supply chain risks, to provide evidence or advice for understanding the critical areas that we care about in managing risks and resilience going forward, in order to ensure global supply chain security.

**The Chair:** We will move on now to the issue of Ukraine.

- Q73 **Baroness Neville-Jones:** It has been well publicised that a lot of countries are being very hard hit by the absence of Ukrainian grain. I do not know to what extent the Russians are finding it difficult to get their grain out. Presumably they can export, but it is clearly creating quite a lot of hardship.

To what extent do you think the world will be able to offset this kind of supply hiccup from elsewhere? I expect you may say to me, "Well, it all depends how long the war goes on". But do you have a feel for the extent to which the price shock and the supply disruption turn from something short term into something that has longer-term significance?

**Professor Tim Benton:** I would not be surprised if, in 20 years' time, we are still living with the consequences. If you think back to the last

directly comparable event, in 2010-11, when there was the extreme heat in Ukraine and western Russia, that led to a rise in food insecurity, here and all around the world, and riots in 30-odd countries. It sparked the Arab spring, the rise of migration across the Mediterranean, the rise in nationalism across Europe, et cetera. We are still living with the consequences from that, in a sense.

As you look ahead, we have this year's harvest. Where are the Ukrainians going to put their grain, because there are not any empty silos at the moment? Are they going to harvest it or is it going to rot in a field? We know that there is still an interdiction on fertiliser supplies, so when it comes to planting it again in the northern autumn, will planting be as extensive as it is needed to be to go back to the status quo?

As you look ahead into the medium term, even if the war ended today, it is unlikely that sanctions against Russia would allow Russia to come back as part of the international community. Depending on how the war goes, you can very easily see a much more fragmented, bipolar or multipolar world rather than a unipolar world. If we move into a world that is more fragmented, and we have been doing some scenario work at Chatham House about this, it is likely that you are, in a sense, in a deglobalisation perspective.

If we are not trading with the same sorts of partners that we have got used to thinking about trading with in a globalised world, food prices might well be high for ever, looking ahead. It is wrong to think of this as a temporary crisis that we will get over because, whatever happens, we are likely to have the immediacy of disrupted harvests for two or three years. Then, in the long run, it might well be a situation where things are radically different.

**Baroness Neville-Jones:** So you think that in retrospect it could look like a tipping point.

**Professor Tim Benton:** Yes.

**Baroness Neville-Jones:** There is the thesis, is there not, about the French Revolution that a partial stimulation, if not actually a major causation, was three years' bad harvest beforehand?

**Professor Tim Benton:** Absolutely, and that is the challenge in this space, because if you have grievance against Governments and you cannot afford to buy your food on daily basis, that is what ends up happening. The Arab spring was not caused by a food price spike, but it was set off by the food price spike because there were people who were deeply unhappy about the way things were.

You could very easily imagine, with the global cost of living squeeze, increasing risk of recession, particularly in the northern hemisphere, and growth in sovereign debt in the southern hemisphere, that many countries will be in a situation where there is either social or civil unrest, labour disputes and so on.

**Professor Neil Morisetti:** If you look at the scale, I think it is some 26 nations that depend on Russia or Ukraine for at least 50%, if not 100%, of their wheat. That includes Somalia, Sudan and Egypt, which will have to borrow in order to subsidise for the issues that Tim has been talking about.

You also have potential problems depending on what the Chinese harvest is and what is happening in South America. In France, earlier this month or last month, there was a challenge because of the heat affecting the wheat harvest. The price of fertiliser means people are sowing less, even in the UK. All of it is just pushing the price up, and the issue is how great the impact is and therefore how severe the consequences are in the early years.

**Baroness Neville-Jones:** You have the practical complication of sanctions, too. Professor Morisetti, I want to take advantage of your maritime expertise. You said something a few questions back that certainly stimulated my interest in that aspect. At the moment, we have the blockade in the Black Sea. You mentioned something else in the Arabian Gulf. Do you think there is a longer-term threat to freedom of navigation in international waters when it comes to merchant shipping?

**Professor Neil Morisetti:** Yes. Could I say where?

**Baroness Neville-Jones:** Yes, do.

**Professor Neil Morisetti:** I was about to say that was more challenging.

**Baroness Neville-Jones:** I would like to know where the pinch points are.

**Professor Neil Morisetti:** One is the northern sea route. Russia treats that as an internal sea. We do not necessarily have the same checks and controls as in the Suez Canal or the Panama Canal. If Russia wishes to interfere with the flow of traffic, albeit it is a relatively short season at the moment and it is for relatively shallow-draught vessels, that could have some bearing on supply chains.

If one nation does it, will other nations start to say, "Well, they got away with it, so why can't we get away with it?" If you look at the chokepoints around the world, they are potential areas where you could see some disruption of trade. As for whether you would get lots of pirates rushing out or whether you would actually get state interjection, it is probably more the latter than the former that would have an impact.

The fact that the United States has not ratified UNCLOS, the UN Convention on the Law of the Sea, puts it in a difficult position to act, aside from the fact that international institutions are taking a bit of a drubbing at the moment.

**Baroness Neville-Jones:** I see. It adds up to a potentially quite unstable situation, does it not? It adds to the problems of overglobalised supply chains.

**Professor Neil Morisetti:** Yes, and you have the South China Sea and the north of Australia.

**Professor Lenny Koh:** This is a very good point that links to the primary and secondary impacts. So far, the impact to the UK supply chain in wheat or sunflower, for instance, has been a bit, but it is minimal, because we are not too dependent on imports affected by the war from Russia and Ukraine. There could be a secondary impact in the future. The primary impact right now is just energy, but we need to think beyond that.

**Angus Brendan MacNeil:** On an earlier point about food and food planting, general harvests, and what have you, if people can cast their minds back earlier this year to March, the political hot potato of seed potatoes was on the go. There was talk of sending 2,000 tonnes, or 2 million kilos, of seed potatoes to Russia. Eventually, after much political and media froth and what have you, those kilos were not sent, which plant-wise is maybe 20 million kilos less harvest, if no other substitute of potatoes is found, to be harvested in Russia.

The question is multidimensional politically, but just from a food point of view, for guidance, should we be using food as a weapon in the way we did there? What are your thoughts on that particular episode as regards informing, say, next year's spring?

**Baroness Neville-Jones:** The Russians are, of course, using it as a weapon.

**Angus Brendan MacNeil:** Yes, they are, and we had used it in March as a weapon. That is right. It is a bigger weapon now, but I was just looking for thoughts from our witnesses on that.

**The Chair:** Nobody is rushing to respond.

**Angus Brendan MacNeil:** It is a political hot potato. That is why I asked the question. Do we have a world with 20 million less kilos of potatoes to be harvested? Maybe. Given that it is Russia that is not harvesting them, do the witnesses have views on whether that is good or bad? That is basically what I am driving at.

**Professor Tim Benton:** Food has always been used as a weapon of war, but normally against the particular country that you are in conflict with. To a certain extent, the potato example is that. What Russia has done with the blockade of the Odessa ports is to turn that on its head, and it is using food as a weapon of war from a global perspective, i.e. targeting the most vulnerable of people around the world rather than people in Ukraine. That is the first time ever, I think, that it has been used in that way.

**Angus Brendan MacNeil:** It is indiscriminate rather than targeted.

**Professor Tim Benton:** Absolutely, and what food security means has not been widely discussed from a security perspective. If, across Europe,

we ate 10% to 15% less chicken and pig, that would make up for all the grain that is not coming out of Ukraine, so there is potential on the demand side.

Just as with energy we can insulate lofts and reduce our energy demand, we can very easily reduce our food demand, particularly in the rich nations, by changing the balance of what we eat. Across Europe now something like 70% of all grain goes into livestock feed, so a small change in the amount of meat that is eaten on the market, which will probably happen anyway because meat prices are going up, will reduce the demand for grain.

The fact that a certain amount of food has not been harvested does not necessarily mean that that is a crisis, because there are many ways in which we can have a more resilient food system, particularly if we are flexible about what we demand.

**Baroness Neville-Jones:** It comes back to adaptation.

Q74 **Lord Strasburger:** I must say that the answers to the questions so far have been so unremittingly pessimistic that it is all I can do not to reach for my revolver, but I will ask you another one, about energy shortages, which will probably take me in the same direction. What is the likelihood that we will see energy shortages in Europe in the coming months, particularly in the light of EU's most recent sanctions on Russian oil imports and Russia's demands for payments in roubles?

**Professor Neil Morisetti:** I have to say that I am probably going to depress you a bit more.

**Lord Strasburger:** Thank you.

**Professor Neil Morisetti:** Fatih Birol, the executive director of the International Energy Agency—I think it was last week—spoke about the risk to Europe of energy rationing. It might be tempting, because we take relatively little oil and gas from Russia, to think that it will not affect us, but in reality, by virtue of the interconnectors and the periods of peak demand when we are drawing on European-generated electricity, which is frequently generated from gas, that will present a challenge.

There are undoubtedly risks, but there are ways around it as well. An energy strategy that, as Tim has just alluded to, is demand-focused as well as supply-focused can reduce demand quite markedly and quite quickly through behavioural changes, and then through relatively short-timeframe changes of insulation of properties and greater use of renewables, rather than the longer-term supply issues such as opening up more oil and gas or revisiting nuclear power.

**Lord Strasburger:** I will go a bit more into the potential mitigations in a moment.

**Professor Lenny Koh:** There will be an impact on energy security, not just in the short term but in the medium to longer term. In order to

design into the system resilience of energy supply for the longer term, we need to think about our own production of energy. This links to the energy strategy that has been launched recently and the importance of alternative sources of supply. The roles of renewables, hydrogen, nuclear, et cetera, will be very important.

To put this together, we are trying to drive low-carbon, net-zero energy supply, and then use more UK content in construction and in the supply chain, in order to minimise dependency on the global supply chain. Again, although production is key, we need to look at this from a whole-system perspective—consumption, behavioural change, et cetera—as has been mentioned before. It is crucial.

**Professor Tim Benton:** You asked about the short term. Clearly, there is an element of what happens to the conflict and whether we escalate sanctions for whatever reason, but the big hidden thing will be what happens to the weather and, therefore, what happens to demand. If we have a cold, snowy autumn that is very wet and we have not filled up all our gas cylinders, of course we will run out of gas, whereas if we have a nice, mild autumn and a nice, sunny Christmas, and no one has to turn their heating on, it will not be a problem. The potential for there to be widespread effects will be mediated by the demand side, particularly through the weather, so let us hope we have a good weather forecast.

**Lord Strasburger:** In terms of potential mitigations, what can we do in both the short term and the long term?

**Professor Tim Benton:** There is no point in thinking about small modular reactors and opening up fields in the North Sea. By the time any of those come on stream, we will be 20 years down the line and we will have solved the problem or just given up on climate change.

In the short term, as I say, the demand side is almost unmentioned in the UK energy strategy. In the European REPowerEU, there is a lot more effort on the demand side—turning down thermostats, insulating homes and so on. To a certain extent, it is the same for food. As I mentioned, we have the demand side for food, which could mitigate some of these issues.

The most immediate, important thing is demand. If you think back to 1973 and all that, it was the demand side that solved the issues. It is not finding alternative suppliers of fossil fuels at a time when we know we have to be driving the energy transition as quickly as we can.

**Lord Strasburger:** So can you foresee a return to rationing?

**Professor Tim Benton:** It would be unwise of us not to think of what would happen if we do not have enough primary energy supply to meet demand. Of course, some form of rationing might be necessary. This would not necessarily be economic rationing by just letting the price go up, which is a form of rationing, but potentially a more equitable form of rationing. It might be the three-day week that I just alluded to, which we

lived through, or it might be some other means of doing it. Governments around the world will have to tackle this sort of thing with a straight bat, because it is possible.

**Professor Lenny Koh:** We need a combination of energy technologies, both short and long term, to boost our energy security and resilience nationally. That includes the requirement for nuclear power stations, because our existing nuclear power stations are ageing. Of course, we have Hinkley Point C and many more that will be supported in the near future. These are very, very important, in addition to the SMRs.

In addition to nuclear, we need a combination of renewables, especially offshore wind, for instance. We have managed to drive a lot of investment and a lot of supply chain SMEs into this particular area. They play a significant role in boosting the economy, creating jobs, and taking our technology and innovation to the next level. We are very good in doing this as one of the net-zero leaders in the field.

Thirdly, but not the least significant, is the important role of hydrogen. Hydrogen will be a significant energy mix in the entire energy system. The hydrogen strategy has been prioritised by the Government already, and the US has put a lot of investment emphasis on hydrogen production capability in three areas: green, blue and pink.

In order to produce blue hydrogen, they are working with the oil and gas sectors; producing green hydrogen involves electrolysis, fuel cells et cetera; and producing pink hydrogen relies on the link with nuclear technology. These are important parts of those systems in order to maintain the resilience of our energy system as a whole.

**Professor Neil Morisetti:** I know that our national energy strategy is relatively new, but we need to review it in light of what we have learned in the last couple of months and where the indicators are, some of which we have talked about already this afternoon.

In particular, we need to focus on the demand as well as the supply, but we need to do more than that. The greatest form of energy security is to use less, so energy efficiency, irrespective of the nature of energy you are using, should be there. That requires behavioural changes, some relatively short-term fixes, and a narrative to explain that to the public, but we have to think beyond that. Secure, sustainable and affordable supplies of energy are essential for economic development in a world where you are trying to drive down your greenhouse gas emissions, so you need to think about what the nature of your power generation will be, whether for industry, for electricity or for heating.

In moving away from fossil fuels, there are many options. We just talked about hydrogen, nuclear and renewables. As you go towards low carbon, you need to think about where the investment is in the research and development and in the infrastructure for moving this power around. Already, we are seeing that as more and more people put renewable solar panels on their houses, the grid is struggling to cope, because it has

been designed to generate in one place and transmit out, and is now getting power coming in as well.

We need to think about research and development in hydrogen, nuclear and all those things, but we also need to acknowledge that we will be on fossil fuels for some time, probably principally gas, so we need to ensure that there is stability in those regions where we get our gas and some of our oil from, which tend to be those that, as we talked about earlier, are being impacted by a change in climate. We need security of supply chains, some of which comes through a presence in the regions or building capacity in those regions. Right across the piece, it is one of those issues that you have to look at over the longer term rather than just the immediate.

**Lord Strasburger:** I think I ought to get my revolver. Thank you.

Q75 **Baroness Hodgson of Abinger:** I have a quick question on this, probably directed mostly at Professor Morisetti in his role as a farmer. Do we have a conflict of interest between diversifying energy and a food strategy that will push the UK to produce more food? Quite a lot of our agricultural land now has solar panels on it. We have a very small bit of land, but I hear from other farmers that it is sometimes more economic to put down solar panels on their land than to grow food. Also, a lot of crops are going to biodigesters. Should we be preserving good land for food?

**Professor Neil Morisetti:** You make some particularly salient points. People say, "Well, don't worry, the sheep can graze underneath the panels", and that sort of thing, but the reality is that we have to think about a strategy for the use of land in this country. We probably should be taking poor agricultural land out of the system, because of the amount of chemicals and everything that people are putting into it to try to get a viable crop, and the damage that is doing to biodiversity.

On the issue of whether it is biodigesters or ethanol, we have to be able to veer and haul on that, with a degree of recognition that there are certain points when we will perhaps have to step back a bit in the amount of wheat or maize, or whatever crops are going into these areas, but that is why you need that strategy. You then need the ability to measure how effective your chosen paths are and where the issues raise themselves.

**Professor Tim Benton:** If I can just add to Neil's riff, you talk about growing food. We are for ever getting caught in this trap in which we are talking about growing food, but what we are largely growing, and increasingly, is feed, whether an industrial feed stock such as corn for ethanol or a methane digester, or stuff to put into cattle. We can think about our overall balance of agricultural outputs as feed, food or industrial products, but we need a land use strategy to decide what will be the best combination of those. Almost certainly, bioethanol and biomass are not a good use of land, from my perspective, given the amount of carbon leakage, so it becomes nugatory in terms of doing the right thing.

**Professor Lenny Koh:** There is a potential synergy between food security and energy security from the farmer's perspective. For instance, the waste generated from the farm can be used as a biomass feedstock to generate energy. There is this idea of a circular economy in which you can create additional value.

Q76 **Baroness Anelay of St Johns:** I would like to bring us back to the immediacy of the global food crisis that has been caused by the Russian invasion of Ukraine, and to think about what the UK should be doing. What interventions are available to the UK Government? Have they done enough so far to address the issue? If not, what more would you like to see them do?

**Professor Tim Benton:** We clearly have the issue of the cost of living crisis at home, and food insecurity of people. Depending on what happens over the next few months, you could imagine a very significant proportion of people requiring access to food banks and social support in the UK. At home, that is the number one thing. It is not about how we can grow more of the same sort of food, but absolutely about how we can ensure that people have access to the food they need in ways that they can afford.

Then it comes to mitigating the overseas cost of living increases in the sense of what the UK can do to create the impetus for a humanitarian corridor coming out of Odessa, for example. What is the role with respect to that? How can the UK and the G7 address the logistics? We will be short of food this year. Compensatory planting is not enough, but there are plenty of markets that will have excess food. Will they have the boats? Will they be available to be able to ship them from the Midwest to Egypt or wherever it might be needed? That is quite a logistical challenge that requires some degree of international co-operation.

From a humanitarian perspective, most of WFP's emergency food was purchased in previous years from Ukraine. Of course, as food prices go up on the commodity markets, a dollar of food aid can buy less food. At the moment, WFP is struggling with international subscriptions because there is far less money in its system than the requirement to cope with the famine in the Horn of Africa. Those are three chunky things there: the cost of living at home, getting the grain out of Ukraine as quickly as possible, in whatever way is necessary, and then that humanitarian response.

**Professor Neil Morisetti:** Briefly, because Tim has covered most of it, there is a need to ensure that we reduce the risk of food poverty in this country. Clearly, that is a priority, but equally important is not to look at this as just a national issue. It is the point that Tim made about the risks to global instability and the consequences of food poverty around the world that the Government need to be as engaged in as they are in the domestic issues.

**Professor Lenny Koh:** I agree with the points that have been mentioned already. In addition, we can invest more in this particular area

by bringing the expertise, technology and innovation that we have created from UK universities and partnerships with industry; improving our partnership prioritisation with key partners across the world, particularly those that we have very strong relationships with; and forming alliances to join forces in addressing these global supply chain challenges.

**Baroness Anelay of St Johns:** I would like to pick up on the comment made by Professor Benton and picked up by Professor Morisetti about the international aspect. In doing so, I will declare my registered non-pecuniary interest as the new chair of UNA UK.

Thinking of what the UN can do, I noticed that, last month, the Secretary-General said that Russia must permit the safe and secure export of grain stored in Ukrainian ports, and that he was in talks with the Russian Federation about this issue. He listed other countries with which he was talking about how to get the grain out. The UK was not on that list.

On that basis, what should we be doing at the international level to ensure that it is possible to release that grain this year, so that the silos can be emptied and, we hope, filled again? Should we be using our Security Council position to do that and to ensure that there is also a debate in the UN General Assembly? What hope is there of that? Professor Benton, you said that we do not have a co-operative world, but, in this case, is it not going to be in the interests of a lot of people to discuss it?

**Professor Neil Morisetti:** This must be UN Security Council business. That is what the UN Security Council is there for, not just in the sense of cold war or hard power issues. The UN Security Council has to have this on the agenda, as do all members, in particular the P5. That makes it challenging when at least one is clearly not engaged and one is pretty silent.

**Professor Tim Benton:** I would fully agree with Neil, but it is challenging. Russia on the Security Council is challenging for the UN as a whole, given the 1947 charter that Russia has gone against, and the UN risks having no credibility unless it deals with these issues. At the moment, it cannot deal with these issues because it all gets vetoed. That seems to be a bit of a problem, looking ahead, for the ability to have a multilateral rules-based order that works.

**Baroness Anelay of St Johns:** Might the Luxembourg proposition that has been brought forward be a good idea for the UK to press even further? I know that we were one of the signatories to it. It would mean that the UN General Assembly would have a proper voice on these matters when there is a veto. Is that something that we should press ahead with?

**Professor Tim Benton:** Yes. I cannot see any solution that does not involve doing something in this space.

**Professor Lenny Koh:** I agree with both Neil and Tim in this regard. The UN Security Council plays a significant role. We are already a signatory partner in that council. In addition to that, within the UK we could have a similar mirror council to look into this issue, which cuts across food and other areas that we mentioned today.

Q77 **Chair:** There is no question that the role of the UN Security Council is supposed to be to secure peace and security. From what you have all been saying, it is very clear how big a risk this is to peace and security. Could I invite you to speculate just a little? Do not if you do not want to. Could NATO countries sign up to taking part in something like this without it turning into a NATO-Russia conflict?

**Professor Neil Morisetti:** We are incredibly close to 1962 and we are walking a very thin line at the moment. I do not think that there is necessarily unity in NATO, and there are not the checks and controls that were in place in 1962 between the Warsaw Pact and NATO, so it is unlikely that NATO will go down this road.

**Chair:** Yes, I rather agree. Finally, the Government told us recently that they are conducting more proactive food supply chain horizon scanning by gathering, collecting and sharing data. In your view, do the Government have an adequate level of intelligence and risk awareness? I asked you earlier whether there is a forum where business and government can exchange. Do they have enough intelligence and risk awareness on supply chain disruption? If not, what should they be doing? Professor Benton, you are shaking your head.

**Professor Tim Benton:** Sorry, I have reached for the revolver again. Part of the challenge in this space is that whenever anybody says "supply chains", they are taking a very complex system and linearising a piece of it. Take the example that surprised almost everybody before Christmas when, with energy prices going up, fertiliser factories shutting and no CO<sub>2</sub>, we could not cull the turkeys, so Christmas was cancelled. Is that a turkey supply chain issue, an energy cost issue, a fertilizer supply chain issue or a CO<sub>2</sub> supply chain issue?

You need to look at things systemically, not linearly, and there are not enough institutions, including government, putting the pieces together, because we sectoralise everything. We are no longer in a world that can be sectoralised, because everything is so interconnected through complex supply chains.

**Professor Neil Morisetti:** Without that picture, you cannot make informed decisions. To build that picture, you need to bring together many more actors and acknowledge the complexity and interdependencies in order that you have effective indicators and warnings of what is going on, can make the right calls and, I hope, make some of them in a proactive manner.

**Chair:** That is instead of just saying, "Let the markets sort it out".

**Professor Lenny Koh:** Taking a system view is crucial, as has been mentioned by the other speakers. In addition to that, we can consider a life cycle perspective, thinking about the infrastructure that we are looking at, for example CNI. From a life cycle perspective, that will also help in understanding not just the short-term but the medium and longer-term impacts.

**Chair:** Thank you very much, all three of you. We are very grateful to you for giving evidence to us today.