HOUSE OF LORDS

Environment and Climate Change Committee

Uncorrected oral evidence: Methane

Wednesday 8 May 2024

10 am

Watch the meeting

Members present: Baroness Sheehan (The Chair); Lord Duncan of Springbank; Lord Frost; Lord Giddens; Lord Grantchester; Lord Ravensdale; The Earl Russell; Lord Trees; Duke of Wellington; Baroness Whitaker.

Evidence Session No. 9 Heard in Public Questions 147 - 165

Witnesses

I: Steven Hamburg, Senior Vice-President and Chief Scientist, Environmental Defense Fund; Dr Liam Hardy, Senior Policy Analyst, Green Alliance; Kim O'Dowd, Climate Campaigner, Environmental Investigation Agency.

Examination of witnesses

Steven Hamburg, Dr Liam Hardy and Kim O'Dowd.

Q147 **The Chair:** Good morning, everyone. Welcome to the Lords Environment and Climate Change Committee. This morning, we will take evidence for the ninth session of our inquiry into methane, focusing in particular on the international dimensions of tackling methane emissions and the UK's role in that. I warmly welcome our panel of expert witnesses and thank them for making the time to be with us today. Special mention goes to Steven Hamburg, who is Zooming in all the way from California at 2 o'clock in the morning. Thank you.

Let me start with some housekeeping. I remind all attendees that the session is being webcast live and will subsequently be available to view via parliamentlive.tv and the parliamentary website. A transcript of the session will made public, but witnesses will have the chance to review it first and make any necessary amendments with the agreement of the committee clerk. I remind members that they should declare any relevant interests the first time they speak. I refer to my own register of interests, as per the parliamentary website, and mention that I am a director of Peers for the Planet, which is an unpaid role.

I will start by asking our panel to introduce themselves.

Kim O'Dowd: Thank you for having me. I am a campaigner at the Environmental Investigation Agency, which is an NGO based here in London. We have a sister office in Washington. We work on a wide range of issues, from forests to oceans to wildlife. In our climate team, we focus on mitigating the most important greenhouse gases. We have been focusing on energy methane, and for the last three years we have been working on the EU methane regulation that was just adopted. I am trying to strengthen the governance framework on the global methane pledge.

Dr Liam Hardy: Hi, everyone. Thanks for having me. I am a senior policy analyst at the Green Alliance, which is an environmental charity and think tank. I originally trained as a physicist, but I now lead our work on methane emissions and related policy, as well as on the decarbonisation of the power sector and the chemical industry. At the Green Alliance, we have published reports and briefings exploring the UK's methane emissions and the opportunities that are available right now to reduce them across all three of the main sectors: agriculture, waste and energy. We know that action on methane emissions is critical to keeping global temperatures below 1.5 degrees or even 2 degrees, but we also believe that quite a lot of action is relatively easy and that the UK is capable of doing much better than it is right now. Thank you again for having me, and thank you for running this inquiry on such an important matter.

Steven Hamburg: I am the chief scientist at the Environmental Defense Fund, which is an international NGO. I have been leading work on measuring methane, largely from the oil and gas industry but from a diversity of sources, for the past 14 years. As a result of that, I have

worked with several hundred scientists around the world on quantifying methane. I also serve as the chair of the Scientific Oversight Committee of the International Methane Emissions Observatory, which is part of the UN Environment Programme. I co-ordinate the science for that international effort, in which the UK participates. I also lead the MethaneSAT team. We recently—two months ago—launched MethaneSAT, which is the most precise methane-measuring satellite. We will produce data over the coming year and will be able to quantify methane emissions from all oil and gas-producing regions of the world with a high degree of precision and quantification.

Q148 **The Chair:** Thank you, and I thank you all again for being with us. Let me start with a question about the global methane pledge, which was signed at the Glasgow COP—COP 21. The initiative was led by the US and the EU, but UK support and leadership at Glasgow were key to its successful adoption. How far do each of you think the commitments made so far by the UK Government go towards meeting the demands of the pledge?

Steven Hamburg: I am not in a position to talk about the quantification of those changes. Clearly, the pledge is important, but we really need to lean in. I could use the example of North Sea gas and oil and the real need to make a commitment to bringing those emissions to near zero. Current data suggests that they are higher than that and that they are higher than the Norwegian efforts in the northern part of the North Sea.

So there is a real opportunity there. As was previously said, we know how to reduce those emissions—there is evidence—but, in fact, that is not always happening. We need to bring that quantitative data to the fore so that we really can track change over time with a level of accuracy. The UK has certainly been leading the way and using science to measure these emissions overall, which is excellent. The atmospheric data certainly suggests that the emissions are dropping, but not at the pace that one would need to meet the pledge. Again, we have to remember that that pledge is a collective pledge. Some countries are in a better position to reduce them faster than others, and the UK is one of them because of the high-quality science and the knowledge base.

Kim O'Dowd: The global methane pledge is a non-binding initiative. However, it requires three things from signatories: the first is a contribution towards the goal of reducing methane emissions by 30% by 2030; the second is increased accuracy and transparency of data; and the third is participation by countries in global initiatives. I would like to look at those three things to see what the UK is doing.

On mitigation and the contribution towards the goal, although the UK has reduced its methane emissions since the 1990s, the reduction has plateaued in the last few years. The UK does not currently have a methane mitigation target or any regulations on methane mitigation. Those are two actions that would be very important if the UK really wanted to commit to the global methane pledge.

Secondly, on data, the UK uses tier 2 and tier 3 of the UNFCCC reporting guidelines, which are the most accurate way of reporting emissions. However, as Steven said, we still see a lot of underreporting on emissions in the energy sector. I know you have heard this data in your previous sessions, but a study showed that methane emissions from offshore oil and gas are currently five times higher than what is currently reported. A study from Imperial College London found that, in London alone, methane emissions are about a third higher than what is reported. So we really need the UK to institutionalise the monitoring and reporting of emissions, for example through regulation.

The last point is on catalysing global action. Here, again, the UK is committed to the global methane pledge. However, it could do more to make sure that countries that have joined the pledge also contribute to the goal. The vast majority of countries that are part of the global methane pledge are developing countries, and they need to have access to stable and predictable funding to mitigate their methane emissions. The UK has contributed to the methane finance sprint by donating $2.5 million towards that initiative. However, it is not enough to make sure that all countries have access to the right funding. We need about $110 billion a year to ensure that we reduce methane emissions by 30%.

The UK is a very important player in the global methane pledge but needs to do more to make sure that it keeps the leadership it has had in the last few years.

Dr Liam Hardy: I can quantify some of the numbers in this question. As has been said, the pledge is for a 30% global reduction in methane emissions collectively by 2030, compared to 2020 levels. A few countries have now produced detailed national methane action plans and shown quantitively what they aim to achieve by 2030.

Canada, for example, is aiming for a 35% reduction. Nigeria, the leader, is aiming for a 42% reduction, Vietnam 30%, South Korea 30%, the EU 23%, and many others are lower than that. On average, these goals come out at a 28% reduction. As of yesterday, 158 countries have signed up to the global methane pledge, but many big methane emitters have not signed up to it, and many of those, as you heard in previous sessions, might be expected to increase their methane emissions.

If every country that has signed up to the pledge—including China, which has not signed up but has promised to take action on methane—cuts its methane emissions by 30%, global methane emissions will fall by 22%, which is far short of the 30% goal because of the countries not in the pledge and not expecting to cut their emissions. If we want to reach that 30% global goal, the pledged countries and China need to achieve an average reduction of 42% by 2030. That should be our overall average goal for all pledge countries. Some will go beyond that and many will not go that far.

In the UK, we do not have a national methane action plan, and the Government have unfortunately rebuffed calls to produce one. However,

at Green Alliance we have calculated all the actions that the Government have planned to take on methane, and the UK's carbon budget delivery plan will, if enacted as proposed, cut methane emissions by 19% at most. That 19% is on the table. We could achieve that under current plans, but 42% is what I think is needed.

All those actions on the table include things like ending routine venting and flaring, the widespread use of methane-suppressing feed additives on all suitable dairy herds, and the near elimination of municipal biodegradable waste entering landfills. I hope the committee understands that there are serious risks in delivering all those policies and that they only add up to 19%. Overall, the UK looks less ambitious than other countries. Essentially, there are no countries except Nigeria that are showing the ambition needed to hit that 42%.

Our research has outlined a menu of low-cost options and interventions that together could cut UK methane emissions by 43%. That would hit that goal. We can take some inspiration from parts of the US and the EU, which have been leading the way on this pledge. As the UK, we have the capability to surpass their ambitions and become a world leader. I will reiterate Kim's point about the finance. As she said, we have contributed $2.5 million to the methane finance sprint. Ireland committed more than us; we were the smallest contributor of a total of $400 million, so less than a percentage point of that.

Q149 **Lord Duncan of Springbank:** How would you measure the confidence in the ambitions of those countries? Quite clearly, it is one thing to set a target but another thing to achieve it. How would you measure your confidence in that? My second question is directed to you, Dr Hardy. You mentioned that you had set out some steps for the UK to reach this target. Have you costed them?

Dr Liam Hardy: The question about confidence is a really good one. Obviously some countries will have more resource than others to implement those policies. However, all those proposals are sincere. They are quantified in such a way that they believe that they are achievable. I have not judged them personally. Others may have done and may be able to comment on them.

We have costed some of those policies. Many of them are free or even have economic benefits. Generally, they are seen as low cost or free, or they generate income. The capturing of that wasted gas from North Sea oil and gas operations, for example, has an economic value, and, as you heard in previous sessions, the capturing of methane from slurry stores also has an economic value. Some of them are more expensive, but they are generally considered to be fairly low cost.

Lord Duncan of Springbank: Would you be able to provide the costs that you have worked out from your steps?

Dr Liam Hardy: We have costs for some of them. They are in our published reports.

Steven Hamburg: That is a great question about the uncertainty. It is highly variable, but there is an effort now, with the added capacity to measure methane with remote sensing, and we will start to have much better data. The UK is in a position to lead that, because the key here is empirical data, not calculated data. We know from the studies that there is a large uncertainty and there tends to be a systematic bias low in a lot of the calculated numbers, even using the official IPCC approach. Thereby, the ability to measure directly will show that there is quite a bit of difference around the world, but we are starting to get that data. That is why I have been heavily involved in IMEO: to be able to produce quantitative data and show it transparently on a global basis. That data is only now emerging.

It is important to recognise your point that there is great variability and uncertainty in the various datasets associated with those pledges. However, we are in a data revolution on methane emissions right now. We will have more empirical data on methane emissions than CO_2. We already basically do in directly measured data, and we will have an order of magnitude more data within the next 18 months.

The Chair: Do you have anything to add to that, Kim? Cost is an important issue.

Kim O'Dowd: The fact that we currently have no entity in charge of verifying the action plans of the countries is absolutely a shortcoming of the global methane pledge. Until recently, there was not even a secretariat of the pledge. The CCAC—the Climate and Clean Air Coalition—was appointed secretariat in September 2023, so hopefully the secretariat will be able to pick up that role in verifying the action plans. This is true if you look at the action plan of the European Union, for example. A lot of the plan just reuses regulation that has already been adopted and does not really propose any new text, apart from on the energy sector.

Q150 **Lord Trees:** My question is about metrics and the opportunities and risks—or pros and cons, if you like—of using alternative metrics to GWP100, such as GWP*, in evaluating progress and carbon budgets and perhaps ultimately trading rules.

Steven Hamburg: If you follow this issue, there are a lot of metrics out in the wild, so to speak, that scientists have proposed. There are limitations certainly to GWP100. However, we have to be careful in picking alternatives, because they all bring some kind of influence and bias with them. One of the things that I have been involved with, and we published in the scientific literature 30 years ago, is using GWP20 and GWP100 as a pair, just like you do with your blood pressure and many other metrics. We compare them. Time matters. Obviously, methane is a short-lived climate pollutant.

GWP* brings its own set of problems or issues. We need to reduce methane below existing levels significantly, as the pledge requires. GWP* implies in a way that that is sort of a luxury. That is not true. Methane is

a short-lived climate pollutant, so if we are not going to overshoot temperature, we will need to drastically reduce methane, because it has the ability to reduce the peak warming and the rate of warming. To do that, we need to make sure that people understand that all methane is additional to the climate, and that can easily be misunderstood with GWP*.

So we came to the conclusion, when we looked at all the metrics, and based on all the history and the reasons why, that you are far better off with a simple one than going to these alternative metrics—GWP100 we can debate, and I would agree that it has limitations—simply adding the 20-year and the 100-year and showing the temporal dynamics between CO_2 and methane in particular, the two dominant ones. There are many out there. If we end up having a disagreement on which to use, we all lose.

Dr Liam Hardy: I listened with interest to the previous sessions about this topic, and it is really interesting. As a scientist, I can really understand the appeal of GWP* and its ability to measure changes in the flow of methane emission rates and their impact on future warming. I can also see why it is appealing particularly to farmers who are working with biogenic methane. I know the committee heard in a previous session that UK agriculture is not a net contributor to warming because methane is such a short-lived gas, but I am afraid that, in the context of our climate hurtling past 1.5 degrees Celsius, our desperate attempts to halt warming mean that that simply is not true. UK agriculture may be in a position where it is inducing slightly less warming than it was a decade or two ago, but we cannot ignore those agricultural methane emissions.

We also cannot accept, on a broader scale, that steady or unchanging methane emissions are acceptable. GWP* would allow that; it would say that there is no warming impact from no increase in methane emissions. That is just not going to cut it for where we need to go, as Steve said.

The other thing that is really important is that small decreases from a high baseline would look like a really positive effect: it would reward some emitters for small improvements, but it would ignore the historical warming impact from building up to that high baseline. The point is that we are already at 1.2 degrees centigrade above pre-industrial levels, and methane is holding us about 0.4 to 0.5 degrees above where we would be without those increased emissions.

In an ideal world, when we reach a position where we have stabilised temperatures and they are not going up very quickly, we can talk about GWP* as an appropriate metric. But right now our priority has to be to cut methane, and GWP100 is an effective metric to incentivise that. I agree with Steve that we could add GWP20 for a bit more short-term insight and information, but the question for policy and policymakers is why we are comparing these things and what our goals are.

If we want to reduce methane emissions right now, GWP100 is an effective metric. If we reach a position in which global temperatures are stable and at an acceptable level, we can talk about GWP*, but

insufficient action on methane emissions is not due to the wrong choice of metric; it is due to policy and political challenges.

Kim O'Dowd: I am not a scientist, so my answer will be slightly different, but I will use some data from colleagues from the Changing Markets Foundation. They looked at GWP* and GWP100 and calculated that if New Zealand, which has a lot of methane emissions, mostly from its cattle, were to use GWP* it would reduce methane by 10% and it could claim that it will be negative-methane by 2038. If it used GWP100, the result would be completely different. So there is a risk from using GWP*. The science behind it is not controversial; what is controversial is its potential use.

Lord Trees: I can see that reducing methane is a quick way to get some cooling, which you cannot easily get from CO_2. But is it not a fact that, if everybody stabilised their methane emissions right now, they would no longer be contributing to increased warming?

Dr Liam Hardy: That is absolutely true, but the reality is that not only are we not stabilising methane but we are not stabilising our CO_2. If we were to get to the point where our CO_2 was at net zero, I would be really happy with a conversation that says, "Perhaps we don't need to reduce methane emissions as urgently, so long as our current temperature is not too high". The point is that we are not stabilising CO_2, so at the moment our priority is to reduce both CO_2 and methane. The metrics that we have are sufficient for that: they incentivise and direct that trajectory.

Steven Hamburg: I just want to follow up on that last point. We have to be really careful about thinking of greenhouse gases as independent. If we take the notion that we are going to stabilise just methane, we will never meet our climate targets. Methane, because it is short-lived, plays a different role than CO_2. We absolutely need to reduce CO_2 as fast as we can. For a whole bunch of reasons, it will be harder to get that to an absolute net zero but, because methane is short-lived, it is a very powerful tool.

If we are going to meet any kind of reasonable stabilisation, we have to reduce methane emissions well below their current level. I do not know of any assumptions pathway that does not include that. If we really want to not have overshoot, we have to reduce methane dramatically. We have to be really careful in thinking that any sector has met its goal simply by stabilising emissions, because it is contributing a significant amount and it is much more difficult to meet the benefits of methane reductions with CO_2.

Q151 **The Duke of Wellington:** As always, I declare my agricultural interests as on the register. We have in front of us a chart showing that methane emissions from agriculture have come down a little, but they have been relatively stable over the 35 years on the chart. However, fossil fuel and waste have come down quite dramatically. If there was a chart going back much longer—200 or 250 years—and agricultural methane could have been measured then, would it show that it had been relatively

stable over a very long time? Of course, fossil fuels and waste have gone up dramatically since the start of the Industrial Revolution, even if they are coming down now. Would you like to comment on that?

Dr Liam Hardy: I am not an expert on the long history of UK agriculture, but my understanding is that, in essence, the number of animals and intensity of farming have increased, alongside the Industrial Revolution and the population growth that came with it. I do not know the numbers, but I am certain that, pre the Industrial Revolution, there were fewer cattle and sheep and therefore less human-induced methane emissions. However, there may have been more wild animals—I know this came up in a previous session—which were ruminant and contributed to methane emissions but from a natural source rather than from a man-made source. The trend would be the same, so there would have been an increase in agricultural methane emissions from the activities of the British economy, as a result of the Industrial Revolution and the farming revolutions that came with and before it.

The Duke of Wellington: Surely the increase in methane emissions since the start of the Industrial Revolution must have dramatically come from burning fossil fuels—coal and, later, oil and gas—whereas agricultural emissions may have increased with the number of animals. Recently, the number of animals has been coming down and waste management is a relatively recent phenomenon of the last century. I am trying to understand how we compare with other countries of a similar type—Germany, France. How do our historical methane emissions compare to those countries'?

Steven Hamburg: I am not an expert in the numbers for the UK or Europe, but it is certainly true, as to your point, that fossil fuel production of methane has increased dramatically since the Industrial Revolution. In Europe, particularly in comparison, there has not been a lot of oil and gas production, so it is really about coal and its supply chain. We have to be very careful in thinking just of the geography of a country, as opposed to the supply chains that it influences.

You also have to remember that there has been a big change in agriculture, not just in animal units but in how it handles waste. The waste from pasture-raised animals will not produce much methane; a cow pie sitting in the pasture will be aerobic, meaning that there is oxygen in it, so there is very little methane.

The moment you start having centralised and more intensified agriculture and aggregating that waste, you will have much more methane. The waste side of agriculture can be quite large and hard. I do not know the details in the UK—I have not been involved in measuring it directly—but I have measured on other farms. For the most part, that is the part of the equation where we do not have a good handle. There are a lot of slurry ponds and other places where manure is handled in different ways that contribute much more methane, not because of anything that anyone does negatively but because it is hard to customise and measure them; they vary a lot.

So in a big part of the industrial agricultural world—I do not mean that in a pejorative sense—we have concentrated it and brought in modern technologies that would have increased it. The relative increase in the industrialisation of fossil fuels is obviously much higher, because we did not use fossil fuels prior to that. We have had agriculture for millennia, obviously, but we have to be careful in characterising that.

The only other thing I will come back to again is that we have to recognise that all sectors have to lean into the methane issue. In oil and gas in particular, which I have worked on extensively, there is absolutely no reason why it cannot be extremely low. Everybody has to lean into that. We are seeing, under the oil and gas decarbonisation charter from the last COP, a recognition from the industry. We have to hold it responsible for that. We have to get them really low. We also cannot afford for agriculture not to play its part. Will it be proportionally the same? I doubt it, but it has to be significant—whatever "significant" means—and it will vary from country to country and practice to practice.

The Duke of Wellington: That is very helpful. Can I ask the two witnesses who are present in the room and are based here in Europe to comment on the comparability of our situation with that of France, Germany and other northern European countries?

Kim O'Dowd: I have some data from the Global Methane Initiative, but it goes back only to 1990. Between 1990 and 2020, France reduced its agricultural methane emissions by 16%, Germany did so by 22%, while the UK did so by 11%.

The Duke of Wellington: Interesting. That is in agriculture.

Kim O'Dowd: Just agriculture.

The Duke of Wellington: What about other methane emissions?

Kim O'Dowd: I do not have data on waste, but I do on fossil fuels. I can compare to Norway, for example—again, between 1990 and 2020. Norway's methane emissions in 1990 were 670,000 metric tonnes of CO_2 equivalent. That is quite low, because back then the UK had 11,070,000 metric tonnes of CO_2. It is now at 7,534,000. In comparison with Romania, which is one of the biggest gas producers in Europe, in 1990 it was 7,004,000 metric tonnes of CO_2 equivalent. It is now at 3,359,000. So, on the reduction in the UK, emissions have decreased but not necessarily at the same rate as in other countries, and they are still much higher than the emissions that Norway had in the 1990s.

The Duke of Wellington: Of course, Norway has had different rules on venting and flaring from the very beginning.

Q152 **The Chair:** Steven Hamburg made a very interesting point about the waste from agriculture, including from cows and cattle. We have heard previously in the session about how predominant methane is from the front end of the cow as opposed to the back end, but we have not really addressed the quantity of the waste. Where can we go to get more

information about that? I know you said that you do not have it, but where would you recommend?

Steven Hamburg: In the UK? I do not know. I have not spent enough time working on that problem. I would encourage you to look at how many farms are concentrating their waste—I assume that it is a large number—and then at the diversity of ways in which they are handling it, because that really makes a difference. There is also an issue even with biodigesters. They can be very leaky, which can be a problem.

On the notion of renewable methane—I apologise for getting into the weeds a little here—you have to be really careful, because if you are producing new methane from waste, which certainly has a lot of attraction, and it is leaky, you can create more net warming than you are solving. We see that in many situations, and I would be very surprised if it were not happening in the UK, because it is hard to generate it and keep it totally sealed so that you are not emitting 5%, 8% or 10%.

The Chair: Indeed. As I said, it would be interesting to get some figures on the benefits of cattle being in the open and producing waste, as opposed to being in closed environments. It is certainly an issue that we will look into further.

Q153 **Baroness Whitaker:** Good morning. I would like to turn to the UK's international role, to the extent that it exists. Some of this has been covered by Ms O'Dowd. Can you specify the extent to which the UK engages in research diplomacy and international policy fora on methane mitigation? Could this be improved? It would be helpful if you could also mention any private sector fora, not just the international community.

Then, in more detail, is the UK sharing best practice internationally in areas where it has been successful in mitigating methane emissions? To what extent is the UK actively involved in international collaborative research on methane and partnerships between the public and private sectors—as in the development of MethaneSAT, for example? Finally, what impact can all this have?

Kim O'Dowd: Thank you for your question. One issue we have on methane is that we do not really have any negotiation place, for example for the global methane pledge. We do not have one meeting that is held every year to discuss methane and improve the policies. I have organised a few conferences on methane. That is the case for the Global Methane Forum, which happened in Geneva just a few months ago, and the Climate and Clean Air Coalition annual meeting, which was held in Nairobi last February. Those are the spaces where countries can engage with other countries to discuss potential partnerships and best practices, as you mentioned.

As far as I know, the UK might attend, but it does not have a strong role in the Climate and Clean Air Coalition, which, in case you did not know, is a body of the UN Environment Programme, which is in charge of short-lived climate pollutants and has been working on methane probably for the last two decades. It supports countries in developing their methane

action plans and monitoring their methane emissions, and it provides some financial and technical assistance to developing countries. The UK is part of the CCAC—the Climate and Clean Air Coalition—but it is not part of the secretariat, for example, and it does not engage particularly in any big activities that the CCAC organises.

A big area where the UK could contribute in a significant way is funding. We have talked about this before. We said that the UK contributed $2.5 million to the methane finance sprint, but France, for example, contributed $22.7 million and Germany contributed $21.8 million. To make sure that countries have access to the assistance they require, we need more funding. Actually, we do not just need more funding; we need the funding to be centralised. Currently, developing countries that would like to invest in methane mitigation can go to certain countries, to the Climate and Clean Air Coalition, to the World Bank or to philanthropy to get support for that. But that means that they have to go to multiple different funders. They might receive a chunk of money to monitor methane emission in a land field, for example, but they do not know whether they will receive additional funding to continue monitoring, to develop an action plan to mitigate the methane emission, to implement the action plan, to hire the right people in the Government, et cetera, in order to do the work they need to do.

To make sure that they have that, we need stable and predictable funding. We need countries to have access to money in one place. A big answer to that would be the creation of a methane fund. We have a similar initiative under the Montreal protocol on HFC mitigation. It has been extremely successful. We could think about the UK pushing for the creation of such a fund, which would be funded by donor countries—the UK, France, Germany, the US, Australia, et cetera—and held by a secretariat, which would be in charge of deciding where the money goes. That would allow countries to know that they have the right funding through to 2030 to mitigate methane emission.

The UK could have a very big role in this and be more present in the international sphere by donating more money. It could also be at the forefront of the creation of this fund, which would be the most useful thing that the UK could do for other countries, so that they can access the assistance that they need.

Baroness Whitaker: From what you say, our impact is much less than it could be.

Kim O'Dowd: Yes, that is what I mean. The UK also has a big, important role in its big financial institutions. We could leverage this leadership.

Baroness Whitaker: Apart from funds, which may or may not be easily available, we have quite a reservoir of expertise. Does this not fare well in international collaborative research and so on?

Dr Liam Hardy: Steve will be able to talk about MethaneSAT very well, as well. To my knowledge, there is not a lot of activity from within the UK

to support other countries with that expertise and knowledge. There are cross-border academic partnerships, but I am not aware of many. I know that there is something on monitoring, reporting and verification, but I am afraid I am not super-clear on the details.

We have encouraged the team responsible for the global methane pledge in the Government to work with experts, for example from Defra, to provide that policy and technical expertise to countries that are still working to facilitate landfill gas capture. We are very good at that in the UK. It is one of the few areas where the UK—alongside Europe; Europe also does well there—is doing much better than the rest of the world, as well as in the diversion of biodegradable waste from landfill. The UK could use its capacity to help other countries in that regard.

The only other area I will mention is rice cultivation. It has not come up much because we do not grow rice in the UK, although a lot of other countries do. Rice cultivation is a huge source of methane. A particular technique called the system of rice intensification can cut methane emissions from rice production by up to 70%. We could roll that out to the majority of rice paddies around the world. In total, it would cut 100 million tonnes of methane a year, which is about 50 times the UK's annual methane emissions. The UK, through the FCDO, has given small grants to projects to experiment with that system of rice intensification. It would be quite interesting to explore a wider adoption of those techniques through our trade deals with international partners.

Steven Hamburg: The UK scientific community plays an important role in the global methane research community. Some of the names that immediately come to mind are the National Physical Laboratory, which was involved in several large global studies, and Imperial College. I will just do a shout-out for Euan Nisbet, recently retired from Royal Holloway, who I work with directly. He is on the science oversight committee of the International Methane Emissions Observatory. There are many other researchers.

The UK has an enormous potential to lean into this problem with the research establishment. It is one of the leading countries with respect to the science. However, I want to clarify something that was said previously. The Climate and Clean Air Coalition is the group that provides the secretariat for the global methane pledge, but it is a policy arm. A separate institution in the UN, the International Methane Emissions Observatory, is focused on the science and the data. It is making a concerted effort to do international research. It involves the UK. There have been studies quantifying emissions from the North Sea through an effort that was initially located at the CCAC but is now at IMEO. There is also an opportunity for the UK to step up to formally join IMEO—it has been involved, but I do not believe that it is a formal member—to help to fund and because of the growing need to have a global coalition that produces high-quality data.

That is critical, because, as I mentioned at the top, we need to move away from estimated emissions to empirically measured emissions. The

UK has been a leader in doing that and it needs to bring that leadership to the global stage. Part of that comes from the project I am involved with, MethaneSAT, to produce higher-quality satellite data. The UK has not been involved in the production of MethaneSAT, which uses technology that is export controlled in the US—it is restricted to only US citizens—but it is an integral player. Anything that you can do to make it possible for more UK scientists to lean in will be enormously beneficial to the global community, because, without a doubt, the UK is one of the leading countries for methane research and methane knowledge.

Q154 **Baroness Whitaker:** There is a view that the UK is behind other countries in commercialising new monitoring and measurement technologies. You referred to funded public sector work on an international level, but what about the scope for more commercial development of our expertise, which we are not always terribly good at?

Steven Hamburg: I do not know the UK commercial sector particularly well. It is growing, for sure, but we have to be a little careful. That can help to serve individual clients but, for the most part, the commercial sector is not very effective at creating the radical transparency and data that we need for broad action. It can be heavily involved in developing the technology that allows us to make those measurements, but we have to be careful that data is also made public, because we need to understand these problems. There has to be a balance there.

I have been involved in working with a wide range of private companies to enhance the ecosystem of methane measurement. It has grown by orders of magnitude in the last decade, and the UK has certainly been part of that. I cannot quantify it relative to other countries, as I simply have not looked at that question.

Q155 **Lord Giddens:** I will ask you a question that has been partly answered, so you must choose which aspects are most important. What technologies or practices that have been effective at reducing agricultural methane emissions have been adopted in other countries? Could the UK follow suit? What policies or regulatory systems are already in place to encourage and support the use of those technologies and practices? Could you make some brief comments on President Biden's US methane reduction plan for agriculture? It looks very impressive from the outside, I must say.

Steven Hamburg: As has already been mentioned, rice is important. I realise that the UK is not a rice-growing nation, but it is a rice-consuming nation. I would make one qualification in relation to the earlier comments, and this applies in many contexts. There are really good management practices to reduce methane from rice production, but you must be very careful in doing that, because in the process of creating the conditions that allow less methane to be produced by the microbial community, you can increase the production of N_2O—nitrous oxide—but then you have just traded a short-lived pollutant for a long-lived one. I have been involved in work in India and elsewhere showing those ratios, so one has to be careful. I am not saying that you should not work on

rice and that there are no opportunities to reduce emissions there—there very much are—but we must remember to think about it in a broader context.

We talked earlier about ensuring that, as you bring agricultural waste together, particularly from animals, you handle it carefully and understand that the moment you make it anaerobic—you take away oxygen by putting it into slurry or some kind of contained environment—you will potentially have very high methane production. That can easily add up. I do not know practices on UK farms well enough to say how variable and important those are.

The other thing, which I am sure is largely being addressed, is that nutrition really matters. Higher-quality nutrition reduces methane emissions in cattle, so there is an opportunity there. Again, I assume that most of that is addressed in the UK, but I do not know the numbers directly.

Methane reduction efforts in the US have been focused mainly on oil and gas. That is not low-hanging fruit; that is fruit lying on the ground. There is absolutely no need for it and there is enormous potential to reduce it. The methane rules that were approved formally by the US Environmental Protection Agency in the last couple of months are focused on oil and gas. There are also rules at the state level on oil and gas. In California there are regulations related to agricultural methane emissions, particularly from waste, again, and handling waste effectively. These are very large farms, so they have very large quantities of waste.

Again, as we collect better data in the United States, which we are doing—we have collected a lot of data—understanding how methane emissions vary across agricultural activities becomes key. We are behind in the empirical data on agricultural methane emissions relative to oil and gas and coal. It is important that we get that higher-quality data so that we can understand how it varies.

I am a scientist, so by nature I want to see the data first rather than jumping in and making assumptions about how things are happening, but, again, you are well positioned in the UK to collect that data if it were funded appropriately. You have the scientific capacity, which does not exist in many countries, as was pointed out earlier. However, the US has leaned in heavily overall to reduce methane emissions, recognising that reductions in methane represent an important and powerful tool for addressing the climate crisis. As in my earlier point, it is not about creating stability in those methane emissions; we really have to reduce the total emissions if we are to meet our objectives.

Kim O'Dowd: Technologies and practices are part of the solution to mitigate methane emissions in the agriculture sector. However, it is important that countries adopt a holistic approach to this sector. The global methane assessment has found that targeted technical measures at production level will not be enough to reach the goal of reducing methane emissions by 30% by 2030, and that Governments also need to

adopt measures to promote healthier diets, with less and better meat and more sustainable food production.

Some countries have taken steps towards this. The Netherlands, for example, has invested €25 billion to reduce livestock numbers by 30%, and Germany, in its 2024 budget, has integrated $42 million to promote plant-based diets. We also need to think about the role of companies in this, particularly in terms of data. We need to ensure that companies report their methane emissions on the whole supply chain and push companies to adopt mitigation targets and action plans to reduce their methane emissions.

Dr Liam Hardy: I agree with everything that has been said so far. There is a need to explore a modest amount of dietary change—for our health as well as for climate impacts—but there are a couple of interesting examples on the technical side from other countries that it would be good to touch on. I know the committee has already heard about the acidification of slurry. Denmark is an interesting example of a country that routinely does this. I think over 20% of its dairy farms use a process of acidification to neutralise the ammonia and the methane emissions from their slurry tanks. In the UK, Defra has in the past offered grants for infrastructure to allow farmers to acidify their slurry, but those grants were withdrawn in 2022. The committee might be interested to ask Defra and Defra Ministers why slurry acidification is not getting a greater take-up in the UK and how they plan to boost it.

Another technological intervention that I know the committee has heard about is methane-suppressing feed additives. There is one product on the market in the UK that can cut methane from dairy cattle by around 30%, which is Bovaer, or 3-NOP. That product is also licensed and approved in the EU. In fact, the EU was ahead of us in that regard. There are countries that are starting to subsidise its use. Belgium and Slovenia now have subsidy schemes for the uptake of methane suppressants. That is a relatively cost-effective intervention and certainly cheaper than some of the other carbon abatement measures that we have in our ELMS policies in the UK.

There is no real obvious reason not to support farmers to start using those products in the UK as they are in other countries. It would very much fit under the public money for public goods mantra of ELMS; methane action should fall under that. That is another thing that the committee might want to ask Defra: what it is or is not doing to support the uptake of those products, and why.

Finally, we also have the Centre for Innovation Excellence in Livestock, which is funded by Defra. That would be a great body to do more and better research into those methane-suppressing feed additives.

Lord Giddens: Thank you for your very helpful answer. From having interviewed quite a few people now, there seems to be a massive range of technological innovation that this huge global problem has created. Most of that is pretty global, so there is a semi-positive side to all this

that one should keep focused on.

Q156 **Lord Duncan of Springbank:** This is a very quick question picking up from what Baroness Whitaker said. We were talking about the UK's contribution to research funding and research diplomacy. I am curious about subnational contributions to that work. I think again of corporations, universities and so on. Is there any way of quantifying how much money has been mobilised at a subnational level to influence some of these wider issues? There may not be, but if there is I would be curious to know what it is.

Dr Liam Hardy: I do not know off the top of my head. Where we are with methane is where we were with carbon dioxide some years ago, so there is still a bit of catch-up to be played. Since the global methane pledge there has been much more salience about the issue. So more action is starting to come online, but we are still a bit behind in some ways. I am not able to quantify it, I am afraid.

Lord Duncan of Springbank: Mr Hamburg, do you have any thoughts on that? I am trying to think about how much money goes into universities that could be used to mobilise thought, new technologies and new ideas beyond that simple contribution from a state.

Steven Hamburg: I do not have a number for the UK. I am trying to think of all the specifics I know. The British Antarctic Survey planes have been an important source of methane emissions data around the globe. I am not up on all the details, but I am aware of numerous campaigns in different parts of the world to try to collect important data, literally as the planes are in transit. That is certainly UK-funded.

I can also think of specific projects that have been funded, as I said, through the International Methane Emissions Observatory that involve UK scientists. The work at NPL that I was directly involved in setting up a number of years ago was matched by the UK Government, so that brought international money that was matched by the UK Government to try to use some of the real expertise at NPL. A set of North Sea studies, the early work of which was all funded by international sources, was also carried out by UK universities. I do not have a sense of the overall picture, other than it is certainly not an environment that is flowing in research funds; they are very definitely restricted. I cannot tell you the scale of that.

Again, I cannot stress enough the incredible quality of the science community in the UK to address these issues. You have a really powerful tool there that I certainly sense is not fully utilised. It could be much more of a global leader if it had the resources to fully exploit the talent and knowledge in the UK research community. I do not have a sense of how much comes from the private sector. I am not aware of a lot, but that may simply be my ignorance and not the fact that it does not exist.

Lord Duncan of Springbank: That is helpful. Thank you.

Q157 **Baroness Whitaker:** This question covers several of the recent subjects,

particularly the question of feedstock. There is not really time to go into specifics now, but perhaps you could write to us. In all these other countries that are developing methane-reducing feedstock, what are the incentives to farmers to use them – cost [incentives] or other things? To what extent is the UK collaborating internationally in any of that research? I do not think we have time expatiate on that now, but it is very relevant.

Q158 **Lord Grantchester:** I declare my interest in dairying as in the register. Perhaps I may quickly in an aside reflect on many of the answers by Steven Hamburg, especially in relation to the Duke of Wellington's questions about the Industrial Revolution and time spans, and reflect that as production has intensified, strategic leaps are made in methods of production, and often the economic driver of production and returns to a business takes first stage. The socialised implications of that, in other words the environment, have often been ignored in the challenge to reduce global supplies of milk, for example—talking of milk lakes and things like that—and public policy is now struggling to keep up with the implications. A lot of that is happening at the moment as well.

Moving on to my question and returning to the fuel supply, what lessons do the witnesses feel the UK can learn from other countries action on methane? In comparison, how far do all countries need to put the accent more on methane from being separated out from carbon, or is the UK is falling behind others in its policy developments, such as those we see in the emission trading schemes? Even the carbon border adjustment mechanism could be another way in which the UK, far from the Brexit freedoms, is not quite keeping up with the rest of the world. What comments can our witnesses come forward with?

Kim O'Dowd: An important lesson for the fossil fuel sector is that we should not just expect the market to regulate itself. We know that measures to mitigate methane emissions and the fossil fuel sector are extremely cost efficient, even sometimes cost negative, but they are still not being used by the industry. That is why we need regulations. We have seen its effect in Norway, which has banned flaring since the 1970s and now has the lowest intensity in the world. Other countries are following suit. The EU adopted the methane regulation in the energy sector a few weeks ago. It includes a ban on venting and flaring, effective immediately, and programmes to detect leaks and repair them and to address abandoned wells and coal mines that are no longer in use but continue emitting methane for long years after being used. We need to plug them properly to make sure that they have stopped emitting.

So it is important to focus on regulation, which needs to be applied as soon as possible. As Steven said, methane from the energy sector is flowing underground. It is the most effective way to reduce methane emissions fast. It is a win for the climate and for our economies, because when you drill for oil, methane is considered a waste and is just vented in the atmosphere instead of recaptured and reused, for example. It is the same for gas and coal. We need to focus on that and to address this issue as soon as possible.

On the carbon border adjustment mechanism and ETS, a few things are important, especially for the carbon adjustment mechanism. It is important for the UK to consider the fact that it is a big importer of fossil fuels. It is the ninth largest gas importer in the world, and if it wants to put a regulation in place on methane emissions, it has to take into account the full supply chain, not just methane emissions within the country.

In the oil sector and the coal sector, almost all emissions occur at the moment of extraction and three-quarters of emissions occur at the moment of extraction for gas, which means that methane emissions occur before reaching the UK border. This is something that the EU has considered in its methane regulation. It is putting in place some measures to address methane mitigation along the full supply chain. This is what the UK should do as well. It could consider integrating methane in its ETS, as the EU will do in 2026, but this cannot be the only measure. It has to be accompanied by actual mitigation measures.

Steven Hamburg: The development of a methane supply index is critical here. For internal production, you have oil and gas production in the UK, but you need high-quality empirical data. You calculate the observed emissions associated with production and delivery of a unit of energy, including from outside the borders. The UK can play a critical role in supporting the efforts not just of the EU; we need a global methane supply index from all production around the world and show how to do it. We should say that we are going to be transparent about the North Sea. Here is the data. It is what it is, and the UK should make a commitment to reducing it.

It is that transparency that will drive change. Right now, across the globe, lots of people are making many claims about how low their emissions are, and most of them are not substantiated. We just do not have the transparency. That is a role that the UK can lean into, both for domestic production and for any imports, as was just mentioned, and to demand that.

There is also the clean mechanism that is being developed by Japan and Korea, which is looking exactly to do this. The UK has a global leadership role to be able to make this a requirement of the global industry. That will do a lot to drive reductions, because now we will have full transparency. Transparency is the antiseptic we need. We need to understand the data quickly. We need to move away from doing calculated emissions that we are not going to validate to empirically based emissions. This is what we are observing, not a method of how we calculate it.

Q159 **Lord Grantchester:** What are the mechanisms to help the UK jump into that role? How can the international fraternity—for want of a better word—help the UK to meet that challenge?

Steven Hamburg: It comes back to the earlier questions about the scientific capacity. You could have a regular programme of direct

observation of these emissions, certainly from the in-country production, and say, "Here's our data. It is observational. We're tracking it and we demand similar kinds of data from other countries that we import from". I am a scientist, not a policy expert, but you could put in a border adjustment and then say that if it is above a threshold, like the EU is proposing—that it is above our standards—you will have to pay a penalty. The marketplace then becomes an important driver of an industry not just to commit but to demonstrate that it is meeting high standards.

Q160 **Earl Russell:** We have already heard some witnesses say that in many respects the UK is a world leader in controlling methane in waste management. What lessons can the UK learn from other countries' action on controlling methane in the waste management system.

Dr Liam Hardy: I will speak to that, but first I will jump back briefly to the previous question, if I may. We touched on a few things. We talked about regulation and transparency, which I totally agree with. I will give a useful example of regulation for the fuel supply sector we can take from other countries. The US has recently adopted a methane fee, and Norway has had a fee on methane as well as carbon dioxide for many decades. That is worth just exploring a tiny bit.

We currently tax the oil and gas that companies extract from underneath our continental shelf in the North Sea, but we do not tax the gas that they extract and dump into the atmosphere. That is worth exploring. The US methane fee will rise to $1,500 per tonne by 2026. The Norwegian methane fee is currently £1,500 per tonne. If you equate that to a carbon dioxide equivalent, £45,000 per tonne of CO_2 equivalent is lost to the atmosphere. That is an extremely strong signal that has been effective at reducing those emissions in Norway but has not stopped Norway being one of the top 10 oil and gas exporters in the world. So that is a very nice example.

Bridging to the waste management question, the fuel supply sector could learn a lesson from our own waste management sector about the regulations on fugitive emissions and leak detection and repair. I know the committee heard in a previous session that landfill operators have to monitor and check for leaks in their pipelines and systems on a weekly basis. There are no such requirements for the fuel supply sector or oil refineries. Frequent leak detection and repair regulation was also identified by the International Energy Agency as a significant lever in reducing methane emissions from that sector. Again, it is often economically profitable as well.

Touching on waste from other countries, to my knowledge there is not much that the UK could learn from other countries around the world. Maybe my colleagues can speak to that, but it is important to say that although the UK is seen as a leader in waste management, we have not got everything right. We also need to work to avoid sending biogenic waste simply to incineration, which is the default alternative. It is not always optimal.

We could be doing better. The Government currently aim to have separate food waste collections from 2025, but many local authorities will be exempted from that because they have private contracts with the waste management providers that run past 2025 and are difficult to change. We also have the goal to separate municipal biodegradable waste from going to landfill by 2028, but that does not include non-municipal biodegradable waste from industry and commercial sources.

All of that is to say that we are doing fairly well—I do not know of other countries doing better—but that does not mean that we could not go further.

Steven Hamburg: On the methane fee in the US, which I was actively involved with, it is important to note that it is a fee above a fixed threshold. The threshold was determined based on what the industry, in some cases, said it was already doing or was committed to doing. In a way, it calls out this issue of transparency: "Okay, if you're doing that, you don't pay any money, but if you're above it, you do". In the US, the average numbers for the actual emissions observed are roughly 10 times what the industry said it was doing—it is not quite that, but it is an order of magnitude. It is really important to tie in the transparency issue.

I completely agree on the fee. It is a powerful tool to hold folks accountable. Economically, there is every indication that the companies involved, in most cases, should certainly be able to cost-effectively reduce emissions relative to paying the fee, which would drive down emissions, which is the goal.

Lord Grantchester: Does the methane fee apply in agriculture as well as other industries? I am just thinking about the challenge of doing that, how it would work and what it would mean.

Steven Hamburg: I am not aware of one globally. This was explicitly on oil and gas as part of the Inflation Reduction Act. It focuses on the supply chain. I know there is a bit of difference in how Europe defines midstream and what exactly it is. I do not know about in the UK. It included production gathering and processing, transport and compressor stations, but not local distribution, which also has some complications. It is dealing only with fossil methane through natural gas and oil production.

Q161 **Lord Ravensdale:** I want to dig into a bit of detail on the emissions trading scheme. I will start by looking at the metrics. Mr Hamburg, when we discussed metrics in response to Lord Trees' question you talked about multiple metrics, such as GWP20 and GWP100. However, if we are looking at going into some kind of cap and trade arrangement, like the emissions trading scheme, we will presumably have to pick one metric for that and look at things in terms of CO_2 equivalents. If we go down that road, what would be the most appropriate metric to pick in the policy space for that kind of arrangement, such as an emissions trading scheme?

Steven Hamburg: I am not an economist, so I will qualify that at the front end. As a scientist, I am very worried about the notion that you will try to assume a single damage function for these short-lived and long-lived climate pollutants. Personally—this is not my organisation's position—I think we are better served by keeping them separate, like the US did with the methane fee, because they play different roles. I like to describe it as us having two climate problems: we have a short-lived climate pollutant problem and a long-lived climate pollutant problem. If we focus on each of those and maximise the benefits, we will get a much better climate outcome than if we bring them together. If you pick a 100-year timescale, you are favouring CO_2, just because it is a short-lived climate pollutant. If you pick the 20-year timescale, you are favouring methane. We need to do both, and we have to be very careful about trying to mush them together.

My economist colleagues totally disagree with me. They believe that you can create a single damage function. I have challenged them, and I have yet to see that single damage function that makes any physical and natural biological sense, as far as I am concerned. That is the challenge: if you put them all together, do you end up making implicit assumptions about what you are favouring? I consider that a bit of a problem. If, rather than doing that, you try to say, "We're going to minimise methane. Here's our goal. We're going to trade methane"—or pay, put in a fee or whatever—"and here's CO_2 and we're going to trade that", you will get a far better climate outcome than if you try to find that common metric.

Lord Ravensdale: Dr Hardy, picking up on something you said earlier about the metrics, to paraphrase, I think you said the metrics were not too important; we just need to work really hard to drive down methane. Is there a danger that if we do not pay attention to those metrics, the right metrics and the way they are reflected in policy, we will end up prioritising the wrong areas? We have only so much funding to go around. Is there a danger that we could prioritise methane too much at the expense of CO_2? I would be interested in getting your views on that.

Dr Liam Hardy: That is always a danger. Currently, we very much prioritise CO_2 over methane, because we have no real regulation on methane in the UK. Methane is not in the ETS. It has been discussed as potentially being brought in specifically for the fuel supply sector but not in the waste sector or the agricultural sector. So that is what is happening at the moment: we are prioritising one over the other. It is great that we are having these conversations to make sure that we get to the bottom of it.

I agree that you have to be careful with how you use the metrics, but you can use any of them if you use them wisely to achieve what you want. There are very few instances where an action that reduces methane increases CO_2 and vice versa, and where there are they can be handled quite easily. One example is in offshore oil and gas. If an operator extracts the gas and flares it, which therefore burns it and generates CO_2,

that CO_2 comes in under its ETS obligations, but if it simply vented the CO_2 it would not have to pay for or account for it. There are nuances in the permitting from the regulator, of course, but that is one of those perverse things.

I will reiterate and echo what Steven said about splitting those up. It is much wiser and safer to treat them separately rather than try to combine them through a single metric, because you could then have a situation where you incentivise an operator or a business to reduce a bit of methane and not take any action on CO_2, because that might be slightly cheaper, when actually we need them to do both in almost all instances.

Q162 **Lord Ravensdale:** I have a final point on the ETS specifically. If we do bring methane into the UK ETS, are there any other lessons to be learned from other countries that are considering including methane in their emissions trading schemes that we could think about for the UK?

Kim O'Dowd: I would reiterate the point I made before: the EU is integrating methane in its ETS as of 2026, but it is accompanied by a regulation on methane emission from the energy sector. So it is very important to have a holistic view of the way to address methane and to try all the tools that we have in the toolbox in trying to mitigate this important greenhouse gas.

Lord Duncan of Springbank: On incorporating the methane into the ETS, is anybody talking about anything beyond energy methane, such as methane from waste or biomethane from agriculture? I would have thought that trying to incorporate that would be very difficult.

Kim O'Dowd: I know that New Zealand has considered or is integrating methane from agriculture into the ETS, but it is facing a lot of push-back, which has delayed the implementation of this new rule. It is being considered by other countries, but I am not 100% sure whether it is going to cover all sectors in the EU.

Q163 **Lord Frost:** I declare my interest as an unpaid trustee of the Global Warming Policy Foundation. I am afraid that my question may get the same sort of answer as the ones that were just asked, but I will ask it anyway. Some people might argue, although I would not, that border adjustment mechanisms are a useful tool to manage emissions. Has anybody looked at this in the context of methane? Does it face the same methodological difficulties as the ETS, which you just outlined, and other schemes?

Steven Hamburg: I have not looked at the economics of the border adjustment, but the key is data. As I mentioned earlier, I am probably biased because I am involved in producing some of this data, in launching and developing data products for MethaneSAT. But we now have a capacity that is coming online from MethaneSAT and other satellites—GOSAT-GW, from Japan, will launch within the year—to provide empirical data on oil and gas production and the emissions from it, which is independent and key to any of those adjustments. You will be able to get an accurate assessment of the implications of bringing product from place

A, B or C, and how that compares to what you are doing domestically or the alternatives. That certainly creates an ability to make those adjustments transparent and fair, from a quantitative scientific perspective.

Kim O'Dowd: The EU has articles on fossil fuel imports in this regulation and is taking a three-step approach. The first is the creation of a database to understand the emissions associated with EU consumption, in which countries, and what the exporters are doing. This database will be made publicly available.

As of January 2027, any company that wants to the export to the EU will have to comply with the same monitoring, reporting and verification rules as the EU. This means that if the UK wants to continue exporting to the EU, it will have to apply the same rules. The EU will also integrate an intensity standard that exporters will have to comply with. If they want to continue exporting to the EU, they will need to have an intensity that is below this number, but that still needs to be defined by the European Commission. That will be applied within six years of the implementation of the regulations, so around 2030. This is not a carbon border adjustment mechanism but is the EU's approach to addressing methane emissions associated with consumption.

Dr Liam Hardy: I would echo that by saying that this is happening already, as Kim has pointed out. The UK will have to comply with those standards. A large fraction of the UK's oil and gas gets exported to the EU. In fact, a lot of the gas that we import we then decompress from LNG shipping containers and then pipe it into the EU, so we will be subject to those standards.

There is an opportunity there, in the sense that, if the UK gets involved in some of the conversations about setting those standards, measurement techniques and verification processes, we will have an opportunity to influence them and make sure that they are aligned with our best interests. If we are not involved, we will simply be subjected to those standards without having an influence over how they are shaped. If the UK were to accept that that is happening and say, "We can do the same", it would not just make the whole process smoother but amplify our impact on other sources from which we import fossil fuels. It is definitely happening, so it is worth the UK being on board with rather than resistant to it.

Lord Frost: That is not a border adjustment mechanism as such, is it? It is not like the mechanism that the EU is bringing in from 2026-28, which is in effect a tariff on imports that do not meet certain standards. What you have described is a regulatory requirement; if it is not met, the tariff is sort of infinity, because you cannot import into the EU. Is that a correct characterisation?

Kim O'Dowd: That is the approach that the EU has taken. Obviously it has just been adopted, and there will be a lot of implementing and delegated Acts on which the Commission will have to work in the coming

years—for example on penalties. The text is not set in stone; more could be done.

The Chair: I think you have addressed this implicitly, but I wonder whether we can have explicit answers to this question: what are the risks and opportunities for the UK in developing such a cross-border adjustment mechanism?

Dr Liam Hardy: I just mentioned the opportunity to have influence over other states' rules, if you can get involved in those conversations and help to shape them. The risks are the potential for an increased cost or price on oil and gas, but the standards that are being developed in the US and Europe are not likely to be so stringent that all suppliers have to pay a fee or they will be prevented from supplying. Most operators are likely to meet those standards. The laggards or worst offenders will have to change practices or pay extra. They do not have enough market coverage to pass on those prices to consumers so, in a sense, that risk is very low.

Q164 **Lord Duncan of Springbank:** We have talked about the border adjustment mechanism for bringing in hydrocarbons and so forth. If you look at total carbon and the role of some economies in the Far East—such as China, which manufactures using different standards from ours—could you envisage a possibility in which tariffs or adjustments, as a consequence of their carbon footprint, can be incorporated into that border adjustment? The idea is that you end up with a tariff on products that come in from those economies, because their carbon generation is considerably higher. In this concept, total carbon is measured in the product, creating a level playing field with producer nations in the West, which are in a completely different scenario and meeting much higher standards. Is that possible?

Dr Liam Hardy: That is partly the intention of the conversation about having a carbon border adjustment mechanism for as many products as feasible. The challenge is always which products are feasible and how accurately you can measure and monitor the carbon embedded in different products. Many industries are not planning to be covered by the carbon border adjustment mechanism in the EU and the UK, mostly because it is very difficult to measure those things. So there is a bit of obscurity there.

Lord Duncan of Springbank: I am asking the question only because, when I was working on the emissions trading scheme in the European Parliament, the challenge was offshoring. Certain industries would struggle to meet the EU ETS. Therefore, there was a risk that they would simply disappear far, far away. Think of steel: it is a challenge to do that in the EU. Importing Chinese steel has a very different cost and economic play, so why would you manufacture steel inside the EU? If you do not create an adjustment for imports, frankly all your heavy manufacturing would end up in China. You would benefit financially, but disbenefit as a globe.

Kim O'Dowd: That is why, if the UK were to develop a regulatory mechanism, it should consider not just its own production but the full supply chain. The EU imports 90% of the gas that it consumes so, if it is serious about mitigating methane emissions, it has to consider the full supply chain. We have seen push-backs from countries in the EU that produce oil and gas, such as Romania, or coal, such as Poland. As a matter of fairness, we need to comply with the rules of the World Trade Organization and apply them within these countries and to the full supply chain. We need to take a very holistic view on this.

Steven Hamburg: One of the distinctions here if you are thinking about hydrocarbon import/export—although I am not an expert in trade—is that we can measure it independently and it is auditable. You can validate the quality of the data that goes into that calculation. If you are talking about embodied greenhouse gas emissions in manufactured products, that gets way harder, because now you have to understand where the energy that was used came from. That cannot be done independently.

The nice part globally now is that we are building this capacity for remote sensing, where you do not need permission to collect the data. The data you can collect in that way is fundamentally different than when you need to have permission and you have to be involved in a hands-on examination of the processes involved. That does not mean that it cannot be done, but it is a very different challenge.

On fossil fuels, the good news is that we will have all that data around the globe available and transparent to everybody. It is an easier application of these issues than for manufactured goods. I am not saying that you should not do it, but it is a harder challenge.

Q165 **The Chair:** Could I ask each of you for brief closing remarks?

Dr Liam Hardy: Thank you, chair, and for the opportunity to speak today. Looking ahead, the UK may wish to restore some of its global climate leadership, especially in a changing world and with the real possibility of a different President in the US after the election later this year. Methane can provide that opportunity. The first step, though, would be a commitment to producing a national methane action plan with ambitious but achievable measures adding up to our fair share, which, as I outlined at the beginning, would be a 42% reduction of our methane emissions from 2020 levels by 2030.

Our current plans add up to a maximum of 19%. There is a lot more that we can do. Our research has shown that there is a menu of low-cost options and interventions that could together meet that goal of 42% or 43% reductions. We can and should take inspiration from the likes of the US, the EU and other countries that have been leading on this. However, we have the capability to surpass that and be a world leader on methane mitigation. I hope this inquiry helps to achieve that.

Kim O'Dowd: Thank you very much for this conversation. I really enjoyed it. The UK could use its leadership on two fronts, the national

and the international. On the national front—Liam said it—we need the UK to adopt a mitigation action plan with a target, and adopt regulation, particularly in the energy sector, which is the easiest and fastest way in which to reduce methane emissions.

On the international front, the UK could increase its leadership as the country that hosted the COP that saw the birth of the global methane pledge. The UK could push for more action internationally, particularly through finance and increasing its financial contribution to developing countries, and in pushing for the creation of a dedicated fund for methane that would allow countries to take the pledge seriously and do all the actions that they are planning.

Steven Hamburg: Thank you so much for this opportunity. It has been a real pleasure. I will echo what was just said but add that there is a real opportunity, as we discussed earlier, to lean into bringing the UK leadership and the science to bear on a larger scale and recognise that the UK has a real opportunity to utilise its scientific expertise to benefit both the country as well as the globe in this area.

Towards that end, I should say that active involvement in that scientific effort on a global basis through the International Methane Emissions Observatory, and formally doing that with the UK, would be extremely beneficial to the globe. In making that strong commitment, I should reiterate what was said about reducing methane as a powerful lever that needs to be pushed down to the maximum degree possible across sectors. I am not saying how much in any sectors but, without doubt, all the sectors have the potential to reduce emissions in cost-effective ways. The emissions will vary across sectors, but those exist across all of them. The literature is unambiguous. So doing will have a beneficial effect on the path forward relative to the damages we are experiencing from climate change. We have to maximise those advantages while we are aggressively decarbonising the economies. There are two climate problems and we have to solve both of them. We should not think of them as trades between them. We just need to maximise both.

The Chair: Excellent. Thank you so much to our panel. We are grateful for your contributions.