

Environmental Audit Committee

Oral evidence: Air pollution in England, HC 1656

Wednesday 18 March 2026

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Members present: Mr Toby Perkins (Chair); Julia Buckley; Jonathan Davies; Carla Denyer; Barry Gardiner; Chris Hinchliff; Martin Rhodes; Dr Roz Savage.

Questions 1 - 30

Witnesses

I: Professor Martin Clift, Professor of Particle Toxicology and Advanced Human In-Vitro Systems, Swansea University Medical School; and Sarah Legge, Vice Chair, Environmental Policy Implementation Community.

Examination of witnesses

Witnesses: Professor Martin Clift and Sarah Legge.

Q1 Chair: Welcome, everybody, to the latest meeting of the Environmental Audit Committee. I am delighted to say that this is the first evidence session of our new inquiry into air quality.

We have two panels joining us today, and the first panel is in front of us now. We have Sarah Legge, who is vice chair of the Environmental Policy Implementation Community, and Professor Martin Clift, professor of biomedical sciences, from Swansea University. You are both welcome. Thank you for joining us.

If I could start by encouraging you to introduce yourselves and, particularly, your knowledge and experience of this area.

Sarah Legge: Thank you for inviting me to give evidence to this inquiry. My name is Sarah Legge, and I am a chartered environmentalist. I have 30 years' experience working on air quality policy and projects. I have been the head of air quality at the Greater London Authority. I have been an associate director at Arup, and I have also run my own consultancy specialising in air quality and sustainable transport.

I am here today representing the Institution of Environmental Sciences, which is the global professional membership body for environmental scientists and practitioners, which includes the Institute of Air Quality Management, and EPIC, of which I am vice chair. EPIC, the Environmental Policy Implementation Community, supports local authority officers and focuses on effective environmental policy and effective implementation, especially around air quality.

Professor Clift: Thank you very much for having me here. My name is Martin, and I am from the biomedical sciences department of Swansea University's medical school. I am a professor of inhalation toxicology. Specifically, my expertise lies in understanding the mechanisms of disease from inhaled particulates and other pollutants. I very much come from the health side of things.

I am also a full member of the UK Government's Committee on the Medical Effects of Air Pollutants, the Welsh Government's Clean Air Advisory Panel and the UK Government's Committee on Toxicity.

Chair: It is always nice to hear a strong Swansea accent on the Committee.

Professor Clift: Absolutely. All nations are represented.

Q2 Chair: Professor Clift, what does recent and emerging research tell us about the human health impacts of air pollution?

Professor Clift: Thank you for the question, which is important because we have known for decades that air pollution impacts human health, but



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the most recent research, and the evidence coming along with it, emphasises the massive burden on human health that air pollution, both in the ambient outdoor environment and the indoor environment, poses. And it is not just to health; it also has a domino effect on economics, the healthcare system and so forth.

We now know a lot of information about the pollutants, whether that be particulate matter of varying sizes, different gaseous compounds, different chemicals or new and emerging pollutants that are coming out. Research is now emphasising that we are never exposed to just one pollutant. We are exposed to a mixture of pollutants, and these pollutants interact with one another and, once inside the body—whether inhaled, absorbed through the skin or translocated through the lungs into the wider body, the cardiovascular system and beyond—they have a completely different effect depending on the person's body and whether they are from a susceptible group, such as if they have asthma or cardiovascular disease. There are all of those factors.

The mechanisms of all this are currently unknown. We know, epidemiologically, that there is a health implication. We know, due to the unfortunate and sad events that have happened in the past decade, with Ella Adoo-Kissi-Debrah's death and Awaab's death in terms of indoor pollution, that these things have a detrimental endpoint—a mortality endpoint. However, understanding the true mechanisms of this low-dose, chronic, realistic exposure emphasises the fact that, of all the different sources—and I must emphasise that sources are the key point—of the pollutants, we do not know enough at this moment in time. We are now starting to put out a broad landscape of pollutants, and we are starting to characterise them and prioritise the ones that are most important in each environment and from each source.

Q3 Chair: Ms Legge, what are the main causes of external air pollution that people experience here in the UK?

Sarah Legge: A number of sources are of particular concern. Historically, road transport has been a major source—one of the largest sources—of pollution, particularly NO_x pollution, including NO₂. Also, domestic burning has become a very big source, particularly of particulate pollution, as well as other sources such as agriculture, which is a big and not particularly well tackled source at the moment.

As we are trying to deal with heating and transport as dominant sources, other sources are becoming important as well. For example, commercial cooking can be a source in certain areas, and there are other sources depending on where the area is. That is why we need tailored action in different parts of the country, whether it is a large city that has a clean air zone or an ultra-low emission zone, or a small market town that has problems because it has narrow streets and historical buildings surrounded by agriculture. Making sure that we are able to deal with both the systemic issues, such as having emission standards for vehicles, but also local action so that local authorities can tailor the action they need,



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and making sure that is all resourced. There is a wide range of sources: transport, heating, industry, agriculture and then things like aviation and shipping in certain places.

Q4 **Chair:** The Office for Environmental Protection's recent report, which was critical in many areas, showed that we have made some progress on air pollution in recent years. What are the main reasons why we have seen some improvements on air pollution? What main policy drivers may have worked?

Sarah Legge: A number of things have contributed to that. The Euro standards, which tackle vehicle exhaust emissions, have started to deliver some real benefits now that we have real-world testing. That has started to work as it was originally intended but, sadly, did not. We are seeing some of those benefits with the new cars that are coming through the fleet. There are also the moves towards decarbonising the transport fleet, moving to electric vehicles over internal combustion engines. All these have benefits for air quality.

It is not quite as clear-cut as perhaps it was for climate change, because we still have tyre and brake wear emissions from road vehicles. Those are still a problem, especially with cars getting bigger and travelling more miles. Some of the high-level stuff at a European level that we are still benefiting from in UK legislation with the Euro standards, and also measures that have been taken locally, such as the ULEZ in London and some of the clean air zones, have gone a long way towards tackling transport in many places. Energy efficiency goes some way to improving heating, but that is still a big source of pollution in some areas, especially where wood is burned.

Q5 **Chair:** Professor Clift, what is missing in our current understanding of the human health impacts, if anything?

Professor Clift: There is a very long list, unfortunately. The biggest thing would be understanding the life course, understanding the effects in utero, at birth, as you are developing in the first 1,000 days, as you are coming through infancy into childhood, but then also understanding the effects of adverse ageing due to exposure to air pollution of people in the 18 to 65 age bracket. There is a lot of exposure there, which is very different depending on your circumstances. We know a lot about that, but we do not know enough about beyond 65 or the impacts when we are in our younger years and how that advances our ageing so that maybe we have the lungs of an 80-year-old when we are 55.

Age is a massive factor in terms of the unknowns, the gaps in research, and understanding how pollutants interact with one another and where the hazard is posed to the human body. This is even before it gets inside our bodies, before it is inhaled. Thereafter, what is the biological interaction and the biological impact of the mechanisms that incite either the onset or the exacerbation of disease states? Research is only just



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starting to understand these massive areas through the Clean Air Programme's research activities that are now coming to maturity.

Those are probably the two key areas and, inside that, it is really understanding that the minority of the human population, especially in the UK, is healthy. It is the people who have these health multimorbidities and these factors. The body is somewhat different from what we would consider a healthy body. Understanding how this interacts with disease states is important.

Q6 **Barry Gardiner:** Professor Clift, tell me about scale. You have given us some of the detail, but the UK Health Security Agency has said that we are talking about 29,000 to 43,000 premature deaths a year. Would you corroborate that?

Professor Clift: I would not refute it. Deaths are one thing, but if you think about the impact on people's health and morbidity, so to speak—I am trying to find my words, because I do not want to dismiss the fact that mortality is obviously the worst thing possible—but you can think about the morbidity aspect.

Q7 **Barry Gardiner:** Yes. In fact, this Committee in its 2010 hearing said that the cost was between £8 billion and £10 billion. Now, the updated figure we have is a £20 billion to £27 billion cost to the economy as a result of those health impacts.

Given that you agree with the UKHSA on the 29,000 to 43,000 figure—and I am not asking you to be *The Economist*—this is having an extraordinary impact on our society, health-wise, economically and in every possible way. Why is it not further up the political agenda? I know you are not a politician, and you might well ask me that question. You said that we do not know enough currently. I have never heard a professor at any university say that we do, because your research grants depend on it. The point is that we know enough, surely. You guys need to be shouting at us enough, surely, to get something done here.

Professor Clift: Yes, I agree with that part. I would argue that, on the figures you mentioned, I would add a zero on the end, if I am honest. It is not in the tens but the hundreds of billions, if not more. That is just in the UK, and that is underemphasised. If you went to Europe, you would get, yes, thousands of billions.

Yes, we know a lot, but we know a lot about very specific pollutants, and that is the nuance.

Q8 **Barry Gardiner:** I wanted to come on to that, so that is a nice segue. The environmental indicator framework shows changes in the estimated emissions of five key pollutants. Tell us about the other emerging pollutants that we could push higher up the priority level.

Professor Clift: Ozone is not considered in the environmental indicator framework.



Barry Gardiner: Ozone, O₃, yes.

Professor Clift: Yes. The biggest one at this moment in time would be ultra-fine particles, I would imagine. That is the key one.

Q9 **Barry Gardiner:** Of course, you talked about the in-utero impacts in your opening remarks. Explain to the Committee what it is about these ultra-fine particles that means they can affect even your baby in the womb.

Professor Clift: Ultra-fine particles are defined as an aerodynamic diameter of 100 nanometres or less—PM_{2.5} is 2.5 microns. If we were to try to think of that to scale, one ultra-fine particle would be the size of a football compared with the size of the Earth. That is the back-of-a-postage-stamp calculation.

When you inhale them, as an example, they can pass down into the lowest part of your lungs. Depending on whether you have a healthy lung or you have something like COPD, where you have gaps in your organ status, they can penetrate it to gain access to the circulatory system. Once they are in the circulatory system, they can penetrate any organ due to their size.

Because of their size, their physical aspect is completely different. Their surface area is larger, which means they can react more inside a biological environment. That means they can be nastier to cells and organs, causing more detrimental effects from a toxicological perspective. These can come in, they can remain dormant, they can remain resident, and they can then become reactive depending on what they have on their surface. If they are carbon-based or metal oxide-based, they can adhere to chemicals and to inorganic compounds.

I was getting at this at the beginning. It is that mixture, that realistic exposure, that we do not understand. We know that these tiny, tiny particles can penetrate any organ. I have three daughters, and they will most likely have pollutants inside their reproductive systems that will be passed on to their potential offspring. This has been happening over tens and hundreds of years. It is that understanding of how that low concentration starts to impact human development if we think about the in-utero perspective, and understanding in any organ the true perspective or impact of realistic pollutant exposure. We do not know enough about that, and that is what research is starting to say we need to focus on.

Q10 **Barry Gardiner:** Sorry, Ms Legge. If the Chair allows me time, I will come to you as well. Professor Clift, you talked about the ageing process. The 2023 Imperial College study specifically talked about cognitive decline and dementia. Can you elaborate on that? That, up until recently, has not been factored into all the morbidity and economic figures we talked about.



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Professor Clift: Yes, and that is where adding the extra zero comes into play. The expert is Dr Ian Mudway, who led a lot of that at Imperial College London. Their research definitely highlights the fact that, as you are exposed to pollutants at a younger age, you start to show cognitive decline decades beyond where you are at that moment in time. They are starting to emphasise that.

- Q11 **Barry Gardiner:** One final medical question, if I may. We hear a lot about antimicrobial resistance. Tell us about the role these substances play in antimicrobial resistance, because people might think that is a weird connection to make.

Professor Clift: Yes, and to some degree they would be correct, but it is more that being exposed to particulates or air pollutants could have two types of effects. They could sensitise your body, making you more sensitive to a biological effect, or they could dampen your ability to resolve exposure to other xenobiotics. Antimicrobial resistance means that the pollutants could, in fact, dull your immune system, essentially. That is another area that we do not know anything about.

- Q12 **Barry Gardiner:** Tell me about soot, or what the posh people now call black carbon. We used to call it soot when we unloaded the coal from the fire.

Professor Clift: What would you like to know specifically?

Barry Gardiner: I was trying to probe the key pollutants that may be lower down the priority list. We do not have soot high on that priority list, but perhaps we should. It would be helpful if you can explain why that might be the case.

Professor Clift: A lot of epidemiological research has been done on black carbon, either directly or as a surrogate for particulate matter. They become synonymous at times, depending on what you read. Because we have so much of that understanding from the epidemiological side, it falls down because we say, "Why should we worry about that?" It is the same argument for PM₁₀.

In my honest opinion, all pollutants should be considered equal in that context. If you have a priority list, what has that priority list been made from? What is its ranking to emphasise that point? Again, depending on source, geographical region and location, those pollutants will be very different. That is very specific in what needs to be emphasised.

- Q13 **Dr Savage:** I have three questions with the general intention of exploring how pollutants are monitored and whether our data gathering coverage is sufficient across England to genuinely inform policy and targets. Ms Legge, I have a couple of questions for you first, and then I will come to Professor Clift.

In your view, how adequate are the current arrangements for capturing reliable data on air quality and pollutants?



Sarah Legge: Do not worry, I will pick up the point I was going to make. Good air quality monitoring allows us to understand air pollution, its sources and its impacts on the population. It is essential to allow us to design and deliver effective action to justify funding and to communicate effectively what is going on with air pollution and why action needs to be taken.

At the moment, England has a relatively extensive monitoring network, but it is reducing and is at risk. Why it is at risk connects to why we are having trouble shouting from the rooftops. If it is all right with you, I would like to summarise what is going on at the moment in England. Then I can talk about why it is under threat and what needs to change.

At the moment, a number of different networks are looking at air quality monitoring. The national Government, through the Environment Agency, run a number of networks, including the Automatic Urban and Rural Network, which has 172 monitors. That is used for national compliance, comparing with the targets and so on. It looks at trend analysis, informing the public whether measures are effective on a national scale. That is run by the Environment Agency. Local authorities maintain some of those and run a number of AURN-affiliated sites.

In addition to that, which measures the core pollutants, a number of networks monitor specific things. The black carbon one is interesting because it not only has health impacts but contributes to climate change. Some people are calling it a super pollutant. There is one on hydrocarbons, one on heavy metals and ones about specific issues like eutrophication and acidification. Those are the national networks.

Also, lots of local monitoring happens to support local air quality management. That focuses on the core pollutants because local authorities have to review and assess their air quality. Where they are not compliant with targets, they have to declare an air quality management area and develop an action plan.

Some other monitoring goes on. Highways England does some. Some citizen science projects have some interesting results and interesting engagement. These have quite a lot of variability, even ones in the same system. The data is not always compatible, which can make comparison difficult. Quite a lot of monitoring is going on out there, albeit not everywhere.

It is under threat because a lot of the core monitoring is done or maintained by local authorities. They have a central role in managing and improving air quality in England, but many of them do not have sufficient support. They do not have enough money. They do not even necessarily have enough staff or the enforcement powers to do this effectively.

The reason for that, and why we struggle to shout about it to get political engagement, is because a lot of them consider air quality to be a low priority. We are coming into compliance with our core targets, including



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the national air quality objectives, despite the substantial and devastating impact it has on health, the economy and inequality. A lot of people say, "We are complying with the targets. That is a success. We have obviously solved air quality—tick. Let's move on and do something else." Because of the pressures that local authorities are under, they focus on their statutory requirements, and air quality is rapidly becoming non-statutory. Those who know about the health impacts know how important it is, but those who are trying to juggle budgets and what is required are struggling to understand why we should do something about it.

We need new and ambitious targets. The reason we still have health impacts while being compliant is because these targets were set in the 1990s. They took into account achievability as well as health. What was achievable in the 1990s is way lower than what is achievable now, and we have so many more health impacts. I am not a professor, so I can say that, yes, more work needs to be done, but we absolutely know enough to take action now, and to take effective action now. We might be able to refine it further as more evidence comes out, but we have enough to go ahead with.

There is no safe level of air pollution, so every measure and every intervention we make has a health benefit. Some of them have climate benefits as well. Having new and achievable targets and a new national narrative to say, "This is important. We need to do something about this", would bring the political support and funding to support the monitoring that underpins all our air quality action.

Coming back specifically to monitoring, the current system has a lot of ageing equipment. A lot of it is coming to the end of its life. Maintenance costs are rising, so covering things like maintenance, calibration and quality assurance. All those costs are rising. The national Government previously funded local authorities to do a lot of this, but that funding has gone, been reduced or no longer covers all the costs. Some local authorities are still doing stuff, especially if they have separate income. The clean air zone authorities are carrying out monitoring. Other local authorities have deprioritised it. Some do not even have dedicated air quality staff. Some have even decommissioned the monitoring they had because they could not afford to keep it running.

What can be done about this? I have talked about the targets. I have talked about a new strategy. Faced with an ageing and underfunded monitoring system, what we really need to do is take a step back and ask whether the system we have at the moment reflects the emissions profile. Historically, it was focused on road transport. Do we need more to look at agricultural sources and places where wood burning is a big thing? Do we need more to look at specific sources that have become more dominant as transport has been tackled in a lot of places? That is not to say we should stop monitoring roads, but we need to make sure that we reflect the current emissions profile.



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The recent expansion on PM_{2.5} has been fantastic. It still has some big gaps, but that will be welcome. We would like the Government to work with the scientific community to set standards and to ensure there is enough funding out there so that the monitoring can be done well enough. There is lots of guidance. The Institute of Air Quality Management has guidance on air quality monitoring, but we need to make sure it is funded so that it is reliable and comparable. This could include low-cost sensors and citizen science as well. There are real reasons for hope and opportunities for improvement.

Dr Savage: That was a comprehensive answer. Thank you.

Chair: That is all our recommendations sorted.

Q14 **Dr Savage:** How do those standards or guidelines in England compare with the WHO targets?

Sarah Legge: At the moment, England is falling behind. We had previously been a world leader. We are coming up to the 70th anniversary of the 1956 Clean Air Act, and we proposed emissions and population exposure reduction as an approach that has now been adopted across Europe.

However, unfortunately, we are falling behind. We have these out-of-date targets. We are not even keeping up with the EU, which has a new air quality directive out. We are certainly not aligned with the World Health Organisation targets. For example, for NO₂, our annual target is 40 micrograms per cubic metre. In Europe, it is now 20. In the World Health Organisation, it is 10. You can see we are meeting 40, but we are not there. Even within the UK, we are falling behind. England has a PM₁₀ target of 40 micrograms. Scotland has a target of 18.

Q15 **Dr Savage:** I have another question for you, Ms Legge. We have talked about outdoor air quality, but is indoor air quality being measured? Are there gaps that ought to be filled?

Sarah Legge: Yes. Indoor air quality is largely unmonitored, despite the fact that some estimates say we spend 85% to 90% of our time indoors. We are not doing much monitoring at all. There is some limited monitoring where there is a particular issue or for research studies. Some new builds have accreditation schemes like BREEAM and WELL. They will do some indoor air quality monitoring, but there is little.

The Born in Bradford study found that poor air quality, in their experience, is linked to health impacts on children. The World Health Organisation limits were exceeded on four in 10 days.

The Air Quality Expert Group wrote a report on this in 2022, which had some really good recommendations. It also identified some of the problems and how difficult it is to do indoor monitoring, including finding representative buildings to do that because everybody lives their lives differently. It identified recommendations, which I agree with, to



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establish a national baseline assessment of a range of homes, covering the heating season and the non-heating season, looking at different socioeconomic types of buildings, particularly looking at shared spaces like schools and hospitals, where some vulnerable communities gather. We definitely need to take steps on that.

- Q16 **Dr Savage:** Thank you very much. I now have a question for Professor Clift. You mentioned ultra-fine particles. How is the lack of continuous monitoring impacting on our ability to understand the associated risks?

Professor Clift: Drastically. If we were able to continuously monitor ultra-fine particles, like we continuously monitor PMs of different fractions, we would know a lot more. A lot of it is hypothetically driven. The ultra-fine hypothesis is a hypothesis at the end of the day. It has been proven, but it has been proven sporadically since the mid-1990s.

Sorry, it seems like a very obvious answer to your question but, if we were to continuously monitor them and improve the monitoring network, not just of ultra-fine particles but all pollutants, as I was emphasising, so that we could understand it better, we would absolutely have a better grasp on the health implications of exposure to these pollutants.

However, this is not necessarily an infrastructure problem. It is also a technological problem, as the technology is not there to put it out en masse for continuous monitoring.

- Q17 **Dr Savage:** Even if the money were available, would there still be technological barriers?

Professor Clift: There would be. I am sure an engineer would say, "If the money is there, we could push forward with that." I imagine that would be the case. Yes, we need to try harder in that context.

- Q18 **Martin Rhodes:** You may have mentioned the other differences already with regard to urban and rural settings, how we measure and what we measure. Does that lead to situations where, nationally, we are not collecting the right data in the right places to inform the right policy choices and to identify the trends that are taking place?

Professor Clift: Sarah has the data on the number of monitors, but we do not have sufficient monitoring in rural landscapes to understand how they compare with urban landscapes. I guess that is for a good historical reason, because they are population centres, but the complex pollutants that you are exposed to in a rural setting compared with an urban one are vastly different and, therefore, the potential health implications are drastically different as well.

Sarah Legge: On rural monitoring, I mentioned the Automatic Urban and Rural Network. There are 21 rural monitoring stations across the whole of England, plus one in Scotland, one in Wales and one in Northern Ireland. There is absolutely nothing in a triangle between Cambridge, Manchester and Bristol. Nothing looks at rural air quality monitoring in



that area, despite the fact that there is an awful lot of agricultural land there. We are not monitoring it in a lot of detail.

There is very little local air quality monitoring going on, because local authorities have very limited powers over agriculture. They tend to focus their limited monitoring on sources that they can influence and control. They are much more likely to monitor a bus depot or a school. They can do nothing about agriculture. It is dealt with at the national level, not the local level. There is little local monitoring that, in other situations, would supplement the national things.

Q19 Chair: Can you explain the main causes of agricultural pollutants?

Sarah Legge: It is not my area of specialism. I have an urban background, but I can tell you that ammonia from agriculture is a particularly strong source from slurries, fertiliser use, spraying and things like that. That is a big factor, as well as particulates from a lot of those as well. Also, non-road mobile machinery is a factor both urban and rurally, and we are only just starting to get to grips with that through a couple of measures coming on. That will include a lot of the farm equipment, and there is also diesel.

Chair: We can ask the NFU to get more information on that, but that is very helpful.

Q20 Martin Rhodes: In terms of the lack of rural monitoring and what has been said about the different types of pollutants, and therefore the different health considerations, would we be better off having more regional and localised targets, rather than national targets, that take into account, first, the different pollutants and their different effects? Also, such a regional base could then mean we push to have the monitoring in rural areas, because you would need to do that to meet the targets.

Sarah Legge: The health impacts are the same, whether you are in an urban or a rural setting, whether you are in London or Carlisle or on the middle of the fence. It therefore does not make sense to have a different set of regional targets. Also, you could have some issues around health and environmental inequalities because you are not offering the same protection to different people. I would not push for that.

I would push for ambitious targets so that everybody gets the same environmental quality in relation to the key pollutants we have been talking about. I gave evidence at the European Parliament debate on the previous air quality directive saying that we need ambitious targets. They went ahead and set what were then ambitious targets. Because of that, the Mayor of London has come out and said, "We have met the targets decades early." That level of ambition is far more important than differentiating between different parts. Everybody deserves the protection that the targets will bring, and that needs to be supported with a strong national narrative.



We need to make sure that we have a comprehensive strategy that looks at the problems with agriculture and the problems with roads. Is a particular area struggling with agricultural pollution? We need to target our funding and our effort there. We will all reach the same goal, but we might want regional focus areas on different types and sources of pollution. That might be a better way to go. The national Government have a real role in pushing that forward and working with local government to make sure it is funded, and working with others—whether that is the Environment Agency, Natural England or farmers—to deal with that.

- Q21 **Martin Rhodes:** To be clear, are you saying that you would have national targets but, within that—in terms of the urban-rural divide and in different regions—you would have different action plans to deal with different pollutants in different places?

Sarah Legge: Yes. Previously we have had air quality strategies. We had one on roads, and we had one that was about what local authorities can do. We are missing one that says, “This is the situation. These are the different problems in different areas. These are the people who have control and influence. This is what we are trying to achieve.” By taking that wider perspective, we can see where we need to put the effort in and where the funding is needed.

I would actually go wider and say that we need to look at how it connects to climate change, for example, and how we can make sure that we are getting benefits from climate change action on air pollution, and vice versa, as well as on transport, health and the planning system. We need a comprehensive and ambitious strategy that looks at that.

Professor Clift: I agree, if you can focus on the key pollutants in the farming industry—if it is ammonia, yes, we know it is farming land and one that we need to keep an eye on. The work that DEFRA, COMEP, AQEG and colleagues did on the Air Quality Information Service, which has come out or is coming out, would be a stepping stone towards that. That highlights the different pollutants at different times. There is currently a pollution warning because the sun is out and there is ozone out there. We already have a small foundation on this, and it is now about coming together and pushing forward.

- Q22 **Martin Rhodes:** I may have misunderstood what you said, so I am asking for clarification. In different settings, in terms of urban and rural, because there are different pollutants, are there different health impacts or are we not clear about that? Would the effects be different because there are different pollutants?

Professor Clift: Yes, in a nutshell, they would be different, but they would also be the same. You would have some short-term effects and some chronic effects. Again, it comes down to the vulnerable populations who are exposed to it. Sorry to get into the detail, but if you are exposed short term to a lot of ammonia, you would probably have a very short-



term effect, and then you could get up the next day and be fine, whereas if you have a very long-term exposure to PM, you would probably not notice anything until decades later. That is to try to put it into a nutshell.

Q23 Carla Denyer: Ms Legge, you teed me up nicely for this question about the correlation and overlap between air pollution and climate change. Obviously they are separate things, but some of the causes are the same or similar. Some of the solutions can help with both, but some can undermine each other. Could you expand a bit more on where there are overlaps, and where they are constructive or negative, and whether you feel that current policy adequately considers and reflects the knock-on effects from one on the other?

Sarah Legge: That is one of my passions, so I am very happy to answer. There are strong connections between air quality and climate change. Some air pollutants are climate active, and we talked about black carbon. Ozone is also very important in contributing to climate change. Some people call them super pollutants because they have both health and climate impacts. Other pollutants have more complex relationships, but the overall impact is that air pollution makes climate change worse.

Climate change makes air pollution worse as well. It affects the atmospheric chemistry. We get more high pollution episodes, especially summer smog. We get more health impacts and more vegetation and ecosystem effects.

You mentioned the common sources: transport, heating, industry, buildings, power and heat. You also have common actors: national Government, local government, city government, developers, industry and consultants. It is the same people working on the same sources on two different issues that are themselves combined. Taking action on either air quality or climate change can give us a double win if we take a slightly wider perspective and get out of our silos.

EPIC, my organisation, has published guidance for local authorities on how to integrate action on air quality and climate change, because they were faced with a requirement to take a statutory duty on one, and they declared a climate emergency on the other. That has been really useful. It outlines how you can integrate action to optimise the benefits, where there are some, and to manage some of the trade-offs, where there are some—things like wood burning and air-tightness risks that increase indoor air pollution if they are not properly managed.

It also focuses measures where and when they will have the most benefit and it increases motivation and support. Some people care deeply about climate change, some people less so, but we all have friends and family who are affected by asthma and so on. That builds the motivation and support for both measures.

Integrated measures are much more cost-effective most of the time, sometimes because we end up going down a dead end and have to come



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back and fix it. Generally, taking that wider perspective helps us develop something much more effective and brings both immediate, here-and-now health benefits as well as global future climate benefits.

We have seen this proven approach go down well at local level. We would like the Government to support us to reach out at a local level, and also to implement something similar at a national level. There is so much amazing work going on that we are not getting the benefits of. We are not capturing those benefits because it is too narrowly focused. We want to see DEFRA work with the Department for Energy Security and Net Zero.

Carla Denyer: So do we.

Sarah Legge: We want to see DEFRA working with the Department of Health and Social Care and the Ministry of Housing, Communities and Local Government. We could get so many benefits if we just optimised these programmes and measures from the design stage, rather than trying to mitigate the problem at the end. It would be so much more impactful and so much more cost-effective.

If I may digress ever so slightly, this interconnectedness is not limited to air quality and climate change. We have a national planning policy framework consultation going on at the moment. Local air quality management says that planning is a key way of getting air quality improvements, but the proposals that have come out limit the ability of local authorities to go beyond national strategies. You limit the ability to innovate on air quality grounds. You limit the ability to look at best practices. You limit the ability for planners to consult with air quality officers, so you are not even going to be in the conversation.

We have a real opportunity to build on the climate change things. I would be more than happy to send the Committee a link to the guidance afterwards, if that would be useful, because we have had amazing feedback.

Q24 **Carla Denyer:** That is great. I can strongly infer your answer to this question, but I take it that you do not feel that current national Government policy adequately considers the interactions between the two. You certainly have lots of recommendations for how to make it better.

Sarah Legge: I would like to see more collaboration, and at an earlier stage, yes.

Q25 **Carla Denyer:** I have a slightly tangential follow-up question. As part of making that better, do we need new national legislation on air quality, or can it be done under existing legislation with new guidance? I am particularly thinking about empowering local authorities to act. We managed to get a clean air duty into the English Devolution and Community Empowerment Bill, but it still risks being a postcode lottery if



they do not have sufficient powers to do so.

Sarah Legge: Yes, it is a good question. I have talked about the need for targets. The Environment Act gives you the power to set air quality targets. Nothing can stop us writing a new comprehensive and ambitious air quality strategy right now that could provide that national narrative and empower local authorities. There is nothing to stop us making sure that local authorities have the funding and the political support to take action on what they have identified as the priorities.

Bringing all of that together under the umbrella of a new Clean Air Act would give additional momentum. Ella's law is going up for its Second Reading. That is the Clean Air (Human Rights) Bill, which deals with a lot of these things, although it does not go as far as what exactly we should do. It will provide the statutory momentum, if it goes through as it currently stands, to drive that forward. We need all those things, but I would certainly support a new Clean Air Act.

Q26 **Carla Denyer:** Finally, we have talked a lot about the impacts of air pollution on human beings, which is very important, but could you touch a little on the impacts of air pollution on the natural environment? Of course, we know that all these things are linked.

Sarah Legge: Yes, there are a lot of impacts on the natural environment. We have talked about climate change. That is a big one, which is not always considered as an air quality issue, but it is important.

Tropospheric ozone—the ground-level ozone, as opposed to the ozone layer—is important because it causes oxidative damage to vegetation, reduces crop yields and so on. It is formed as a secondary pollutant from the pollution we are emitting.

Then we have nitrogen deposition, when things like oxides of nitrogen and ammonia add too much nitrogen to ecosystems and soils, which knocks off the balance of those ecosystems. That is both wet and dry deposition. Dry is when it hits close to where it is emitted, and wet is when it is dissolved in rain and can travel long distances.

We also have acidification, where NO_x and sulphur react with the air and cause acid rain. The pictures of the destroyed Swedish forests that I saw when I was still at school—that dates me a lot—first piqued my interest in air pollution. These are really big issues. Some of them are local, but some are international in their scale.

Q27 **Chris Hinchliff:** Ms Legge, you have already referred to how we are falling behind some of the targets in Scotland and the EU. Briefly, are there other jurisdictions that you would point to as leading the way on tackling air pollution, not just in the targets they set but in how they monitor and implement them? What are the best jurisdictions, what are they doing, and how do we compare with them?



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Sarah Legge: That is a very broad question, and there are some amazing examples out there. A lot of work is already done to share this information. I was speaking at a UNECE expert panel on clean air in cities a few months ago, where we were all sharing our experiences of what people are doing. There are some amazing examples out there.

Also, organisations like the Clean Air Fund and C40 Cities are doing some good stuff on air quality guidelines. We are looking at how applicable the work is that we are doing at EPIC on air quality and climate change. We have guidance on effective environmental implementation. How effective would that be, looking beyond?

There are some great examples. Coming back to the agriculture point, the Netherlands and Denmark have some fantastic examples from what they are doing to control agriculture emissions that we have not fully got behind yet. There are a lot of examples out there, almost too many.

Q28 Chris Hinchliff: That leads on nicely to my next question, but if you want to write to the Committee to highlight any particular examples from other jurisdictions that you think it would be worth us being aware of, that would be helpful.

Sarah Legge: Yes, I am more than happy to do that. One thing I would say, though, is that this country also has some amazing examples that the people who have done them and the people who admire them would like to roll out in other areas, and they are not able to.

Merton and the Greater London Authority are doing some amazing work on non-road mobile machinery in construction. Several authorities in Yorkshire, for example, want to adopt that, but they do not have the funding. They have asked DEFRA for it. They are not able to roll out the examples that we have. Yes, lots of great stuff is going on elsewhere, but there is also amazing stuff going on here—innovative, best-practice stuff—that we are not capitalising on and not applying in every way that could be done. That is a missed opportunity.

Q29 Chris Hinchliff: Similarly, if you could share those examples in writing, it would be helpful.

What you are referring to makes me think that a lot of these sources of air pollution are transboundary or move quite a lot. How realistic is it for us to think that we can substantially limit exposure to those pollutants that are clearly not contained to one localised source?

Specifically, hearing your feedback in relation to agricultural pollution, you talked about market towns. I can think of places in my constituency where, yes, slurry spreading on the fields and crop spraying may well come over to those market towns. What on earth can we do about that?

Sarah Legge: With a lot of these impacts—we have talked about health impacts and nature impacts—it all comes back to controlling the sources and reducing the amount of pollution that is going into the environment



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in the first place. That comes down to what you can control in your area, who is contributing to the pollution, and what they can do about it.

Q30 Chris Hinchliff: Sorry, I am quite conscious of time. That is a very sensible principle to apply, but I want to nail that point. Some of this is out of our control, isn't it? Do we have to accept a certain amount of this in our lives because we cannot control the sources that are not within our decision-making power? How would you respond to that?

Professor Clift: Moving on from that, it also depends on the pollutant. If it is a short-lived pollutant, you will not have that transboundary effect so much. If it is a particulate, yes. To answer your question directly, some things we will just have to accept. If you think about the wildfires in the United States of America a couple of years ago, they came over and hit the UK 48 hours later. There is nothing we can do about that, unfortunately. Within our own borders, yes, we could do something about that, depending on who is producing what pollutants, where the roads are and all these other factors.

Without sounding too trite, it is yes and no. It depends on the specific question that is being asked and for which specific pollutant. Yes, we will have to accept them to a degree, and that is where we have these warning systems where we can contact and alert people if an exposure event has a potential health implication. For other ones where we have this monitoring network and we can see where these major pollutants are being created and so forth, this is where we can act in a localised area and say, "We need to reduce these to get them down to the levels that we know that are better for us in general than the higher ones that we are currently experiencing."

Chris Hinchliff: Ms Legge, any advances on that?

Sarah Legge: Yes, I agree with that. There is stuff we can do and there is stuff we cannot do.

Martin mentioned the moderate air pollution warning. We also have one today for PM, and part of that is because of the Saharan dust in the air. How are we going to control that? We do not have control over that.

I will make two comments to finish. In reducing our emissions, we are helping our neighbours' transboundary problems, like they are for us. Secondly, there is no safe level for many of these air pollutants. Even if we cannot control how much Saharan dust comes into the country, we can control a lot of things that are here, and we can have a benefit on people's health, nature and climate change. Every intervention we make and every reduction we have in air pollution has a benefit. We need to focus on where we can control and influence things.

Chair: Thank you very much indeed, Ms Sarah Legge and Professor Martin Clift. We very much appreciate the evidence and the time you have given us, and the expertise you have brought. We will bring this



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first panel to a close.