HOUSE OF LORDS

Science and Technology Committee

Corrected oral evidence: The effects of artificial light and noise on human health

Tuesday 25 April 2023

10.15 am

Watch the meeting

Members present: Baroness Brown of Cambridge (The Chair); Lord Borwick; Viscount Hanworth; Lord Holmes of Richmond; Lord Krebs; Baroness Neuberger; Baroness Neville-Jones; Baroness Northover; Lord Rees of Ludlow; Lord Sharkey; Baroness Warwick of Undercliffe; Lord Wei; Lord Winston.

Evidence Session No. 9 | Heard in Public | Questions 94 - 105

Witnesses

Ruskin Hartley, CEO and Executive Director, International Dark-Sky Association; Emma Marrington, Landscape Enhancement Lead, CPRE, the Countryside Charity).

Examination of witnesses

Ruskin Hartley and Emma Marrington.

Q94 **The Chair:** I warmly welcome our witnesses to the committee's ninth evidence session for its inquiry into the effects of light and noise on human health. This panel focuses on light, and we are pleased to welcome Ruskin Hartley, the CEO and executive director of the International Dark-Sky Association, and Emma Marrington, the landscape enhancement lead at CPRE, the countryside charity.

The session is being broadcast on parliamentlive.tv, and a full transcript will be made available to the witnesses shortly after the meeting to make any minor corrections. If you subsequently think of anything that you did not get a chance to say or any data or further evidence that it would be useful for us to have, we would be pleased to receive that as formal written evidence after the session.

From your research and campaigning work, what major sources of light pollution do you identify? How strong is our evidence base on those sources of light pollution?

Emma Marrington: Thank you for inviting CPRE to give evidence. In 2016, CPRE created Night Blight mapping with consultants that looked at satellite data on the amount of light spilling up into the night sky. It identified the key sources of light pollution as the highways—roads and the trunk road network—and development. With Night Blight mapping, we can see the strategic road network—the M25 and other roads—showing up in the amount of wasted light shining into the night sky at 1.30 am. Housing and developments are, of course, another key source of light pollution. Domestic security lighting could be a problem, as could warehouses' and businesses' lighting. The Night Blight mapping showed—pre Covid, of course—that the City of London had the highest level of light pollution, the highest saturation of light spilling up into the night sky, at 1.30 am. This is wasted light.

Q95 **The Chair:** You talked about using satellites for your measurements. Satellites measure infrared light, I believe, and new lighting systems have far less of the long-wavelength light. If this is correct, how do we know that we are getting good measurements from the satellite images? Indeed, how do we actually know and measure the level of light pollution? How can we demonstrate that it is actually increasing?

Emma Marrington: The 2016 Night Blight mapping had detailed maps of England—the districts, counties, national parks and areas of outstanding national beauty—using the highest-quality satellite at the time. It measured the amount of light spilling up. Of course, with the changes in lighting—with LED lighting—there is a need to remap light pollution using the latest technology. One of the key issues is getting the new satellites that can measure the amount of light spilling up. The Night Blight data is the baseline and currently the most detailed map for England.

The Chair: So we do not have any trend data. That is what you are telling me.

Emma Marrington: I was going to say that, in CPRE, we have a citizen-science project called the Star Count, which asks people to count the number of stars they see in the Orion constellation. That is a way of getting people on the ground to say what they can see from the ground upwards—it is citizen science. Around half of the people taking part in Star Count count fewer than 10 stars, which indicates severe light pollution. If you count more than 30 stars, that indicates dark skies. So that is one set of data we have. Of course, we also have sky quality readings.

The Chair: Ruskin, would you like to pick up on those points?

Ruskin Hartley: Thank you for inviting us. I wanted to start by acknowledging that the UK lost one of the great champions of light pollution control last week, Bob Mizon, who gave evidence to this committee in 2003. He tragically passed away last week. He was one of the leaders who put light pollution control on the map in Britain, so I wanted to acknowledge his many contributions.

On your questions about the sources of light pollution, I will start by setting out the context. The earth is 4.5 billion years old, and there has been life on it for 3.7 billion years and people on it for 10,000 generations. It is only in the last five generations that we have started to light the night sky, which is one of the most profound changes in the environment that the earth has ever seen. Yes, there are single sources—be they motorways, be they security lights—but really what we have is a proliferation of light that follows economic development and population.

We know this from the satellites and the imagery. For long periods of time, scientists have estimated, based on the satellite data, that light pollution has been growing maybe by 2% or 3% per year. From a citizen-science project called Globe at Night—Chris Kyba probably spoke to you about this—and a study that was published earlier this year, we know that light pollution globally is growing by at least 10% per year.[1] The question is: why is there a disconnect between what we see from the ground, looking up, and what the satellite sees, looking down? Why is what we see higher?

Part of the answer is that the satellites see light only in certain portions of the wavelength. Over the last decade, we have transitioned to LED technology, which has the benefit of being very efficient, but it has also changed the quality of the light at night. In particular, it is less the long-wavelength emissions and more the short-wavelength emissions, in the blue part of the spectrum, which contribute greatly to sky glow and have a biological impact on more living things. Most of the satellites do not see it. So although in some parts of the world the satellites might perceive a reduction in light at night, there has actually been an increase; we know that from images from the international space station. However, because

[1] See https://doi.org/10.1126/science.abq7781

the satellite does not see this—it is as if the satellite is colour blind, like many men—it perceives it as a drop, whereas in reality, as Emma said, if you look from the ground up there has actually been a great increase.

The Chair: You are counting all light at night as pollution.

Ruskin Hartley: Yes. Our organisation made this change recently. It is an acknowledgement of the growing body of evidence about the impact of light at night, particularly on all living things, which have grown up in an environment with dark nights and light days: we need bright sunny days and dark nights. We know from recent studies by Travis Longcore at the University of California, Los Angeles, for example, that light levels as low as a half or a quarter of a full moon are impacting the behaviour of bird species like plover and fish species like grunions.[2]

A couple of years ago, I spoke with a sleep researcher at the University of Harvard, who said that we used to think that humans were immune to light at night, but we now know that we are essentially as sensitive to it as cockroaches. For that reason, we have determined that light at night, when it should be dark, really is a pollutant and people should take it seriously.

The Chair: On the other hand, when we have had a late sitting here in the winter, I know that my female colleagues in particular feel very reassured by being able to walk home on lit streets. We would be unnerved by walking home in the dark, so we would consider that not pollution but essential to life in central London.

Ruskin Hartley: Our advocacy is not to turn off all the lights and plunge us into medieval darkness. It is to value natural darkness at night and to add light when and where we need it to meet our needs. We can talk about this.

Something can be useful and be a pollutant. The analogy I have used is: heaven forbid that someone in my household needs an ambulance at night, but, if they do, I want to call the emergency services and I want the ambulance to come and take them away. It will flash its light, blare its sirens and use fossil fuel, creating noise, light and air pollution, yet it will still be useful. So something can be useful and meet our needs and can still be a pollutant.

Q96 **Lord Krebs:** In a sentence or two, could you quickly say where you think the easiest wins are for reducing light pollution?

Emma Marrington: To clarify, the CPRE is not saying that there should not be any lighting. There should be the right sort of lighting, when and where it is needed. We recognise that there will be situations where there needs to be a feeling of safety at night—as a woman, I am aware of that.

On the changes that can happen, we would like government to monitor and regulate light pollution. This is currently lacking: there is no

[2] See https://doi.org/10.2112/JCOASTRES-D-21-00107.1

monitoring of the changes in light pollution levels around the country. Light pollution is lighting that is not needed or not shining where and when it is needed.

The Chair: We were asking for quick answers on the quick wins. We will ask later about what policy you would like to see.

Emma Marrington: A quick win is improving national policy to tackle unneeded light pollution, including improving national planning and local policy. So I suggest local authorities having better policy.

Ruskin Hartley: Some very simple things can be done to tackle light pollution to meet your needs when you are walking home after a late committee meeting, such as ensuring that all new lights are fully shielded and point down at the ground where they are needed, and ensuring that all new lights are put on control systems so that they can be dimmed down when there are fewer people and turned off when people are no longer around.

I was in Shanghai last week. You can set your clock to 10 pm every night and see them turn off all the lights in the CBD that have been creating the colourful light shows. That is a simple win. People have light when they are around, and then they turn it off. That saves energy and reduces light pollution, and you continue to have safe streets.

Baroness Neville-Jones: My question has been answered. Thank you.

Q97 **Baroness Warwick of Undercliffe:** My question follows on quite neatly from what you have both just said, because it is about the adequacy of our policy response to the problem of artificial light. We really want to know about the night in the round, because it strikes me that a lot of individual responses might be necessary, but they do not necessarily fit in terribly well with policy responses. How well are we currently tackling this issue, on a scale of one to 10? Is it being given appropriate priority by decision-makers? Was the Government's response to the 2009 Royal Commission on Environmental Pollution report on artificial light at night adequate?

The Chair: We are expecting a test of the Division Bell at any moment.

Ruskin Hartley: It is like the emergency alert system on Sunday.

I have asked a number of our local advocates that question about the government response, and the highest number that they gave it was three. I think that is being generous. I will be a little provocative and suggest that it is one, one and a half or maybe two. I reread the 2009 commission report, and a lot of its points are still valid. Although there have been local voluntary actions and some planning guidance, there has not been a comprehensive response to this. Almost every recommendation in that report is still valid and should still be done but has not been done.

What has changed since 2009 is that there are more lights and they are brighter, whiter and ubiquitous. In the areas where there has been more

action, it is voluntary action, particularly through recognition of places as international dark-sky places. There are now 19 of them. The evidence continues to pile up and shows that light at night is a tremendous problem both in energy waste and in the impact on wildlife and, increasingly, on human health. There has not been a co-ordinated whole-of-government response to this. This starts from the fact that there is no recognition that light at night is a source of pollution, in the same way that you recognise the need for clean air and water, and there has been no comprehensive monitoring of this.

Emma Marrington: I might be a tiny bit more generous: four would be my rating. I do not think that government is prioritising this sufficiently. I will cite a difference: in the 25-year environment plan, tackling light pollution was mentioned, but in the updated *Environmental Improvement Plan 2023*, published at the end of January, that mention is gone. The national plan for the environment does not have light pollution in it. That is a missed opportunity. We believe that this should be back in the next plan in five years' time, but it should have been in this version.

I will point out three things about the 2009 report. First, we now have a national planning policy on light pollution, which is good in itself—it is great to have that—but there is a variable approach to it in local authorities. It is a "should", not a "must". That is one difference. You will often find in local authorities—this is from a survey in 2014—that there will be an individual in a council who is passionate about getting light right. That means that they will look to integrate it into local plans, to have better-designed street lighting and to ensure that new developments have the right sort of lighting.

Secondly, a key thing that needs to be improved is statutory nuisance. The Clean Neighbourhoods and Environment Act 2005 made many forms of lighting a statutory nuisance, but, again, the awareness of local authorities in the way noise is recognised by councils is a key issue. They know what to do, but light pollution has to affect a premises in order for the Act to come into play. Legally, that is quite difficult to handle. If you have a problem with your neighbour's domestic security lighting, for example, it is quite hard to take that to a local authority and make it do something about it, even though it is a legal requirement. Transport premises are currently exempt, so there are exemptions like that.

If a council does not have well-designed street lighting—it might be shining into people's homes—it cannot prosecute itself for badly designed lighting. I have heard of many councils currently charging people to have shields fitted so that the light does not spill into their homes. So they are putting up the wrong sort of lighting and then charging people to have a shield fitted. An opportunity has been missed there.

The third thing I will mention is co-ordinated government action. Currently, light pollution almost falls between the cracks. Statutory nuisance is in the Defra remit, but it is also in the remit of the Department for Levelling Up, Housing and Communities in relation to planning. So I suggest having a coherent approach to tackling light pollution at a national level.

Baroness Warwick of Undercliffe: If we are starting from such a low base, in your view, what would be the key to building a much greater degree of commitment in this area? You have described something that will be a mountain to climb.

Emma Marrington: Improving national policy is key. Currently, there is a review of the National Planning Policy Framework, the policy on light pollution should include obtrusive lighting and changes to lighting for existing developments. I would also note relative darkness: even if somewhere is not a really dark place, which we have many of around the country, it can still be relatively dark for a community. Having that is just as important. A key thing would be monitoring and regulating light pollution.

Baroness Warwick of Undercliffe: Ruskin, do you agree with that, as a fundamental basic start to all this?

Ruskin Hartley: It starts with a recognition that light at night is a pollutant that can be addressed. Ideally, many of us would like new national legislation, but the reality is that a lot of statutes and policies on the books can be used to tackle light pollution. Last year, we worked with the Czech Republic's Ministry of the Environment on a similar set of issues in Europe.[3] Rather than having a new Europe-wide directive on light pollution, the approach there was, "We have an existing zero-pollution policy and a goal to protect 30% of our land and water by 2030. All of those benefit from including light pollution as one of the sources of pollution". So, yes, a new national policy or law would be fantastic, but it is also about looking at how you can use the existing initiatives and policies to make quick progress.

I repeat: there are some quick wins. You can use the power of the purse, or the Budget. All new lights that the Government have a role in purchasing should be fully shielded and should have control systems built in. That future-proofs them, and it just makes sense. You will buy the lights and install them anyway, so let us make sure that they can be part of the solution rather than perpetuate the problem. The nice thing about that is that, particularly when you put controls in and dim them down or turn them off, you save energy and money. So it does not even cost the Government more money to do that; it just makes sense.

Q98 **Baroness Neville-Jones:** It does, however, cost the purchaser of the light considerably more to buy a light that has built-in controls. There is a real shift in cost. That is not the point that I wanted to pursue with you, but cost does come into people's daily lives.

You spoke about how national policy is fine, but how do you translate it? One issue is how much expertise there is to understand what you are dealing with. What is your assessment of local and planning authorities' ability to understand the lighting issues, and their capacity to choose appropriate mitigation? You gave an example of inappropriate mitigation:

[3] See https://www.darksky.org/pursuing-europe-wide-action-on-light-pollution/

the wrong light went up instead of the right light, and shielding was then charged for. That sounded like putting things the wrong way round. How much expertise do people have? How can local authorities, without being too authoritarian, enforce policies of a kind that leads to better standards among the electrical fraternity, for instance?

Ruskin Hartley: In more and more of the discussions we have with the lighting community and professionals—the Society of Light and Lighting, the Institution of Lighting Professionals, the CIE in Europe and the IES in North America—there is general agreement on the top-level principles, which we publish in our five principles for responsible lighting.[4] There is no difference between quality light and light that protects dark sky.

There is a gap because local planning officers are busy: they have many mandates that come down from government, and light pollution generally is not one of them. What has happened is that, where local individuals get interested in and excited about this—this happened in the South Downs, for instance—they can find the community of expertise and start to make progress quickly, because there are experts. We know a lot about this: we know a lot more about the impact of light pollution at night than we did even in the last decade, or last year. More and more research is being done every year, and some of it comes out of the UK. One of the world leaders in this is Professor Kevin Gaston at the University of Exeter—he is now on our board of directors.

Baroness Neville-Jones: So what is the effect of all this? It sounds as though you are saying that there are highly variable standards.

Ruskin Hartley: No one sets out in the morning and says, "I want to pollute the night". So this is the unintended consequence of lots of individual decisions made by people who do not have access to the existing information because it is not a statutory requirement and there is no consistency on this; it is one of a long list of things they have to do. So if there is more direction and if there are more standards and requirements, you can do simple things such as specifying the appropriate luminaires.

Baroness Neville-Jones: Can that be remedied nationally?

Ruskin Hartley: Yes, I believe so. In a small country like Britain, it has to be remedied nationally. There has to be consistency for the people working on developments, for home owners and individuals and for retailers.

Baroness Neville-Jones: How do you do this? Do you regulate?

Ruskin Hartley: Our recommendation would be that there should be a national policy of recognising light at night as a pollutant, and there should be a direction for all the various agencies that have a part in this to figure out how to incorporate that.

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[4] See https://www.darksky.org/our-work/lighting/lighting-principles/

Baroness Neville-Jones: That is the "what", but the "how" seems to be the key area—how do you then do that? You can set a goal, but how do you translate it? That seems to be where the gap is, in a sense.

Ruskin Hartley: It needs recognition and monitoring; you need to know whether we are making improvements or going the wrong way. We need a national monitoring framework involving sky-quality meters and other things; some examples of this are happening in other countries. It also needs guidance documents. Again, the principles for responsible lighting are simple: shield the lights, point them down, put them on controls, do not overlight, use warmer colours where possible, and turn them off when no one is around.

People find that bad lighting is just bad lighting: when you have seen it, when you have seen the glare coming from a streetlight, there is no going back to it when compared to a well-shielded light at an appropriate level, which enhances safety. The glare and the harsh light create the shadows that mean that, when people are walking home, they feel less safe.

Baroness Neville-Jones: Ms Marrington, do you agree? You mentioned the statutory nuisance provisions. Can they perhaps be used more effectively than they currently are? Would that be a desirable development, or would that simply sour the atmosphere?

Emma Marrington: There are two issues with statutory nuisance provisions on light pollution. They are not as well known as those on noise, even though they came into force in 2006. So one issue is awareness in local authorities about how to tackle it. Many communities are not even aware that light pollution is a statutory nuisance. We at CPRE are often contacted by people who say, "What should I do about this domestic security lighting?" In 2013, we produced guidance with Defra, the Institution of Lighting Professionals and the Commission for Dark Skies, but that has now been withdrawn from the government website, because apparently the narrative was that the Government did not want to put out guidance for people. That is an issue.

On well-designed lighting, there will of course be different situations and communities. There can be situations where lights are on very high posts on a residential road, so you end up with light spilling directly into people's homes, and you think, "Why is that light so high?" So there could be national guidance to advise on the standards for how lighting should be used. But, of course, that could be tailored to local communities.

I note the cost of investing in dimming or switch-off technology, for example, commonly between 11 pm and 5 am. Years ago, Surrey County Council had a private finance initiative, which cost about £89 million, to redo the lighting for the whole county. That meant that it could then have the discretion to have 100% lighting in a town centre on a Saturday night but 60% on residential roads. So I note that investment.

How can local authorities enforce better lighting? They are responsible, so they could have policies in local plans saying that they will tackle sources of light pollution and look to protect and enhance dark skies in areas. Councils and highways authorities could have street lighting policies that zone the sorts of street lighting they use in different areas of a county. That approach came from Norfolk.

Guidance is very important. You could have national guidance that gives the principles of good lighting; Ruskin mentioned the five top ones. There is also guidance from the Institution of Lighting Professionals about the reduction of obtrusive lighting, giving advice to councils about how to direct light so that it shines downwards instead of spilling out. So the guidance is there, but it is about having awareness among our local authorities. As I said, there are different approaches in councils—often, individuals are passionate about getting light right—and having policies in local plans.

Ruskin Hartley: I will briefly come back to the cost issue. I apologise that I do not have a specific example from the UK, but the city of Tucson, Arizona, where I live, has half a million people and replaced its street lights with ones on controllers, and it saves $2.1 million a year.[5] So the cost of the control systems is coming down and, because the cost of energy is going up every year, adding a control system is becoming a smaller a smaller upfront investment, with greater and greater returns that will only increase over time.

Baroness Neville-Jones: I take your point that the economics are altering.

Ruskin Hartley: They are altering quickly.

Baroness Neville-Jones: Have things gone backwards since national guidance was withdrawn? Why was it withdrawn?

Emma Marrington: As I say, it was because the Government at the time did not want to be seen to enforce guidance on people.

Baroness Neville-Jones: What was the date of this?

Emma Marrington: The guidance was produced in 2013. It is about the principles; it was for home owners selecting domestic security lighting. A lot of people may not be aware that, if they have lighting attached to the outside of their homes, that can cause a nuisance to their neighbours.

Q99 **Lord Rees of Ludlow:** The focus of this inquiry is on the effect of light on human health. We have heard evidence from scientists about this, but of course there are other aspects where we are concerned about excessive light. Since you are both public campaigners, perhaps you can say a bit about what in your campaigns resonates with the public. Are people concerned about the direct effects on health, or are they more concerned about the effect on the night sky—as an aesthetic issue—or on

[5] See https://www.darksky.org/nights-over-tucson/

animal and plant ecosystems? Could you both comment on how the campaigning goes, and compare those issues?

Emma Marrington: In 2010, CPRE and the Commission for Dark Skies carried out a survey of people, asking how light pollution was affecting their lives. We found that half of people had fitted thicker curtains to block out light from their homes, and 3% of people said that they had moved home to get away from light pollution. So, in the health remit, there are mental health and psychological impacts of lighting that shines where it is not needed.

We at CPRE piloted the Star Count in 2007, but we have been running it annually since 2011. People often comment on how, 30 years ago, when they moved to an area, they could see the Milky Way, but they now cannot because of the local light pollution. So there is a disconnect from people's heritage and their connection with the night sky.

Ruskin Hartley: From the conversations that we have had with people around the world and in this country, it seems that light pollution and the loss of the night sky brings many people together. People come at it from different perspectives. Clearly, there is a professional, and increasingly an amateur, astronomy community, whose concern is primarily their hobby and visual access to the night sky. We see increasing concern about the impact of light pollution on wildlife, particularly migratory birds. Major initiatives are going on around to world to turn lights off in cities during the migratory bird season. I believe the UK is a signatory to the convention on migratory species, which has some guidance documents on light pollution control.

Increasingly, people are getting more and more concerned about the impact on human health, and that is no surprise. The vast majority of people today live in cities and in places where they no longer have access to the night sky, and they are concerned about what that means for their children. The loss of visual access to the night sky and of our cultural heritage, in the inability to perceive the stars, is an indicator, in a sense, of all the things that are going wrong down here on earth.

So this issue comes together, and people come at it from different perspectives: from the perspective of energy saving, wildlife loss, public health and the deep history and heritage. It is noted that the Royal Observatory is a stone's throw from here, but you probably cannot observe many stars from it.

Q100 **Lord Rees of Ludlow:** Of course, the main pollution that affects animals is in cities. Dark skies are obviously crucial for amateur astronomers and for seeing the sky. Could you comment a bit on the dark skies campaign? The dark sky is a part—the most universal part—of our environment, and it is sad that, as we heard, the number of stars you can see from a typical location has gone down over the last decade. Many young people never see a dark sky. Could you say a bit about the campaign for increasing the really dark-sky areas, where people can get that experience?

Incidentally, I heard about Bob Mizon's death, which was very sad, because he was indeed one of the most active campaigners on that topic for decades.

Ruskin Hartley: I read the testimony of Bob Mizon in 2003, and he made the observation that we spend a lot of time protecting our environment here on the surface of the earth, which is half of the story. The other half is the night, and we have not taken the steps to protect it. One of the growing global areas of interest, from a tourism and economy perspective, is people seeking out dark skies as an experience. It is one of the fastest-growing areas of tourism. Over the last 10 years, my organisation, Dark-Sky International—formerly the International Dark-Sky Association—has certified 19 international dark sky reserves here in the UK, which in fact has the second highest concentration of them, outside the United States. These are voluntary actions: people come together to say, "We really value these naturally dark skies for the culture, heritage and experience".

We are learning more and more. There has been a lot of discussion about the detrimental impact of light pollution on health, and there is growing evidence of the benefits for our mental health and well-being of being out under a naturally dark sky in a natural environment. It literally resets our circadian rhythm and leads to all sorts of wonderful consequences to people's health over time. So, yes, people are recognising the value and are coming together to work to protect this.

Emma Marrington: CPRE has supported all the dark-sky designations in England, which is obviously fantastic. I mentioned the importance of relative darkness—away from those really dark places—perhaps in a local country park near an urban area. Dark-sky designation offers year-round astro-tourism. Obviously, during Covid, people were not able to go anywhere and travel. So astro-tourism gives an extra boost to the UK economy.

Q101 **Baroness Neuberger:** Emma, you said something about the withdrawal of guidance. Can you both tell us about the major barriers to implementing better policy on light pollution in the UK? Obviously, you have already given the example of the guidance, but what else is a barrier here?

Emma Marrington: One is the awareness of national planning policy, particularly on light pollution. Ruskin said that there are various pressures on local authorities, which have fewer staff and financial resources; they have to cover a lot of bases. So I suggest raising the profile of better lighting. We have the national planning policy framework, which is fantastic, but, as I say, the implementation of it is a "should", not a "must", which means that there will be a varied approach around the country.

Again, I suggest having the regulation and monitoring of light pollution, and improving the statutory nuisance provisions under the Clean Neighbourhoods and Environment Act.

Baroness Neuberger: Ruskin, I would love you to add to that. Do you think that the issue is just not high enough on the public agenda?

Ruskin Hartley: Awareness is relatively low, but it is growing. The body of evidence is growing every year, even compared to the 2009 commission report. More and more is being published.

I hate to say this, but ecologists—and humans—tend to like to hang out and be active in the day, and go to sleep at night, which means that less research has been done on the nocturnal environment. That is changing quickly. We help to maintain the artificial light at night database,[6] and it is difficult to keep up with the body of evidence that is coming from the science.[7] So the evidence is there to show that it is a real issue that people should take care of.

Picking this up as an issue needs leadership from the top levels of government. Unlike many of the other environmental issues that Governments face, this one is so simple to solve. I have worked on vast issues such as forest restoration and plastics in the oceans. We have no idea how to restore an ancient woodland, apart from with time, or how to remove plastics from the ocean.

But how do you remove light as a pollution source? You just focus on providing quality light at night: dim it down, turn it off when it is not needed, and do not shine it in people's eyes. It is so simple. You have immediate results and you save money, so some leadership from government is required to recognise that and to introduce people to the idea that they will not give anything up, except bad light.

Baroness Neuberger: Do other countries do it better? We heard about France's 2018 law. Does that work well, and has it been effective? You spoke about the Czech Republic. What do other countries do?

Ruskin Hartley: A number of municipalities in Italy passed laws, probably 20 years ago, requiring all lights to be shielded. We know that light pollution has not increased in those areas, although it has not reduced yet, but they took the simple step of shielding the lights.

As you mentioned, France passed a law that requires curfews for commercial lights and requires warmer lights, setting an upper limit of 3,000 Kelvin. That was adopted in 2018, and villages in France go to part-night lighting, for which there is clearly support. We believe that, if that is enforced—enforcement is always key—it will lead to results over time. Slovakia, the Czech Republic and Mexico have adopted pollution measures. We are still in the early phases of national Governments recognising that this is an issue, and the UK can be a leader in this regard.

Q102 **Lord Winston:** My apologies for not being courteous enough to be there, but, unfortunately, I cannot be today.

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[6] See https://www.zotero.org/groups/2913367/alan_db/

[7] See for a summary of the current state of the science: https://www.darksky.org/artificial-light-at-night-state-of-the-science-2022-report/

In the oral evidence to this inquiry, we heard numerous claims about the impact on health, but, actually, when it comes down to it, we do not have a huge amount of hard or compelling evidence that there needs to be change. We would like advice on this, because we think it is a bit lacking at the moment. You can see from our stance that we are obviously sympathetic to your point, but we do not feel that we have the evidence we would like to have. So if you can find hard written evidence or research, we would be grateful to hear from you about that in the future.

Following on from the last question, as campaigners, what should you be doing to decide who in government should be responsible for this? For example, is it the Department of Health and Social Care? It would be helpful to have your views on who would specifically target this important issue.

Emma Marrington: Currently, different departments in government have different responsibilities for light pollution, which is why it often falls through the cracks. As I said, the 25-year environment plan had a policy, or at least a mention of a policy, on light pollution, but the *Environmental Improvement Plan 2023* does not, which is disappointing. Obviously, there were other great things in it.

For changes to public policy, research is needed, I absolutely agree. I recommended that research is needed on the mental health impacts of light pollution. So there are various opportunities there. I note local authority approaches to lighting and understanding how local planning works. For the impacts on health and the national policy, it comes down to coherent regulation and monitoring.

On the question about which department should do that, statutory nuisance currently falls in Defra, as I said, and planning is under the Department for Levelling Up, Housing and Communities—I hope I have got that right; I know it has changed a lot recently. That is the problem. I suggest having a central government policy. The *Environmental Improvement Plan 2023* is supposed to be cross-government, as was the 25-year environment plan, but the challenge is making that not just more words, and changing policy on the ground.

Ruskin Hartley: On the evidence for the impact on human health, we know from large-scale studies in Israel and elsewhere that people who live in highly light-polluted areas are more likely to have higher incidences of certain cancers, obesity and diabetes, and we are increasingly understanding the impact on mental health. Those are correlation studies and, although they have deduped them to make sure that they are taking out all the other factors, they are not double-blind medical studies.

From laboratory studies, we know that light at night disrupts our circadian rhythms, so we know the biological functions of that. So my question is: do we have to wait for more evidence to pile up in order to take action, or can we also rely on the precautionary principle and say, "We need to move ahead on this"?

The evidence on wildlife is much clearer, as is the evidence on sky glow; from a physics perspective, we know everything that goes on there. So, yes, the evidence on public health is growing. No studies have said, "Artificial light at night is good for our health". It provides assurance and safety, but, on the impact on our biology, the evidence all points in one direction.

As Emma said, the start is recognising this as a source of environmental pollution and establishing a monitoring framework and network. In the UK context, Defra is probably a logical place to house that, but it requires an all-government approach, because so many millions of little decisions are leading to the brightening of the night sky over time.

Q103 **Lord Winston:** If you think it is so important, do you think there should be a tsar for light pollution or pollution in general, and how would you go about ensuring that that would be more important than other issues, where you have particular individuals who will target this in government?

Ruskin Hartley: Again, I grew up in the UK, but I am a long way out of UK politics now. Yes, it means that some sort of commission or integrated approach is required here. It is also just a recognition that by tackling light pollution you also address the other issues that are already a priority for government. Emma mentioned the environmental improvement report that came out earlier this year and the desire to protect 30% of lands and oceans by 2030 as part of the global framework that is being led by the UN. If you are going to do that, light pollution is an easy win. Light pollution control can help you to protect that. If you want to move to net zero, which you do, and if you want to save energy, light pollution control is an easy win.

The message is that it is not about making trade-offs; it is not about whether we tackle light pollution or climate change, whether we tackle light pollution or protect our natural lands. We can talk about farming, if you want. Do we tackle light pollution or do we support farmers? We know many instances of crop yields being depressed in high levels of light pollution. Light pollution control supports so many of the other priorities of government. Yes, you can tackle it on its own, but it really does support the tackling of other issues and support other initiatives that are already priorities.

Emma Marrington: Lord Rees, a co-chair of the All-Parliamentary Group for Dark Skies, published a great policy plan, in 2020 I think, with 10 dark skies policies for government action. It was 2020, was it not, Lord Rees?

Lord Rees of Ludlow: I think it was, yes.

Emma Marrington: I know it was in Covid times. It all blurs a bit, doesn't it? That report recommended setting up a statutory body for dark skies to punish non-compliance by empowering local authorities and councils to enforce regulations.

You asked about a tsar for light pollution. The report also recommended

appointing a designated cross-departmental Minister for Dark Skies—it sounds very Harry Potter, but it is very important—and giving them a clear remit for the control and prevention of light pollution, as well as oversight of planning and environmental policies that concern dark skies. That would be a really positive move.

Lord Rees of Ludlow: Thank you.

Q104 **Baroness Northover:** It sounds like we need a summary from Lord Rees in our papers to look at.

My question follows on from what we have been talking about. If you think that you have not already touched on this, what are the key recommendations to government for improving its policy in this area?

Ruskin Hartley: Over the last decade or so, many light-pollution control measures have come through the dedication and voluntary actions of great local planning officers or local advocates who have come together, talked to their neighbours and got their communities to take action. That has often led to recognition of their locality as an international dark sky place. All those actions are at risk unless there is a co-ordinated whole-of-government approach.

Again, to sound like a broken record, ideally it starts from the recognition that light at night is an environmental issue which the Government should be concerned about, just as they are about clean water, cleaning up air and other issues. There are simple principles and approaches that they can take to ensure that quality light at night becomes the norm. That is supported on the campaigning side and by the lighting professional bodies; you have also heard from people like Andrew Bissell of the Society of Light and Lighting. There is no gap at a top level about those principles.

It is the recognition that, by focusing on this, you can support many of the other priorities and initiatives of government, save energy and money, promote better-quality wildlife, support habitat and support better public health over time.

Emma Marrington: I would reiterate that it is about regulation and monitoring light pollution—knowing how light pollution is changing over time. Currently, our most detailed mapping is the Night Blight mapping, which CPRE worked on with consultants. There are also questions about how a new approach could be developed, and there is a need to improve statutory nuisance regulation on light pollution so that it covers transport premises as well. There have been consultations on that, but nothing has changed. As I said before, we need co-ordinated cross-government action, too. The recommendations by the APPG on Dark Skies, which I mentioned, are key to achieving that.

Q105 **Lord Krebs:** Could you give us, either now or in writing, some concrete examples of communities or Administrations who have reduced light pollution really well? You mentioned some successful cases, Ruskin. It would be nice for us to be able to quote some in a little box in our report,

perhaps, as an example of how it worked well and why.

Ruskin Hartley: We can certainly look at that. I would be happy to follow up with some international and local examples. In the Lake District at the moment, for instance, Friends of the Lake District is working with a local council up there on a comprehensive plan and strategy for light pollution control, and it has some demonstration projects of better-quality lighting, such as the one that has gone into the town of Kendall, which have been widely praised and appreciated by the local residents.

The opportunity and challenge for all of us is that we need to move light pollution and dark sky issues away from the most remote parts of the country, the rural parts of the country, into our cities and communities, because light does not know boundaries. The light from London, Manchester, Birmingham—these major cities—propagate for dozens if not hundreds of miles, particularly on clear nights. Again, that is why it is critical to take a whole-of-government comprehensive approach across the country.

Baroness Neville-Jones: Some urban examples would be very helpful in that context.

Emma Marrington: One example is Northumberland National Park, which has dark sky status. It has developed a good lighting guide for lighting approaches in the park. I will send you examples.

Lord Krebs: If we could get that in writing, some follow-up, that would be great. I agree with Baroness Neville-Jones about getting examples from the urban environment as well as the rural environment.

The Chair: Thank you very much to both our witnesses for this session. We would be very grateful to receive in writing the evidence that you have talked about. That would be extremely helpful to us.