



Land Use in England Committee

Corrected oral evidence: Land use in England

Monday 16 May 2022

4.30 pm

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Members present: Lord Cameron of Dillington (The Chair); Baroness Bakewell of Hardington Mandeville; Lord Borwick; Lord Curry of Kirkharle; Lord Goddard of Stockport; The Earl of Leicester; Baroness Mallalieu; Baroness Redfern; Baroness Young of Old Scone.

Evidence Session No. 11

Heard in Public

Questions 119 – 126

Witnesses

I: Adam Berman, Deputy Director, Policy, Energy UK; Professor Rob Gross, Director, UK Energy Research Centre.

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Examination of witnesses

Adam Berman and Professor Rob Gross.

Q119 **The Chair:** Thank you very much. Welcome to the 11th session of the Land Use in England Committee. We have before us Adam Berman of Energy UK and Professor Rob Gross of the UK Energy Research Centre. Thank you both very much for coming. You have in front of you a list of interests that have been declared by members of the committee, not that I would suggest you necessarily read those now. The meeting is being broadcast live via the parliamentary website. A transcript of the meeting will be taken and published on the committee website, but you will have the opportunity to correct that transcript if you wish to.

I will ask the first question. What is your assessment of the future energy needs of the UK? Do not forget that we are talking quite long term here. We want to know how these needs might be met and what the likely implications for land use might be, which is what the committee is mostly after.

Adam Berman: A very good afternoon. Thank you for the invitation to appear today. As a brief introduction for those who are not familiar, Energy UK is the UK's industry body for the energy sector across the value chain with a particular emphasis on power, on electricity.

When it comes to our future energy needs, my colleague from the NIC beforehand was very measured. I will be less measured. We are living in a time of profound change when it comes to the energy sector. The reason behind this is clear: it is the need to mitigate climate change. This has resulted in an energy transition, the scale and speed of which we have not seen since the Industrial Revolution. It is a wholesale change of our energy infrastructure in the UK.

We have already made considerable progress in reducing emissions in the UK. Our CO₂ levels are 44% less than they were in 1990. In the power sector, in the electricity sector, they are 75% less than they were in 1990. We have come a long way, but we have considerably further to go. In order to reach the UK's legally binding net-zero target, we will have to see significant changes across the energy system underpinned by a huge expansion of clean electricity and electrification. Electricity is the energy source that will provide the lion's share of energy in 2050 when we look out to what that net zero-compliant energy system actually looks like.

To give you a sense of the scale of change, a recent McKinsey study estimated that electricity demand in 2035 would be about 56% above where it is today. That is just 13 years away, and that demand will continue to increase beyond 2035. We face a dual challenge: the provision of more energy and the provision of cleaner energy. In addition, we need new infrastructure beyond the power sector in technologies such as hydrogen and carbon capture and storage, particularly for industrial use.

We know that additional energy infrastructure will be needed and will require land. That means that infrastructure has to be properly sited, communities have to be involved, stakeholders have to be engaged and impacts have to be mitigated and compensated for. It means that the NPS and the NPPF, as has just been discussed, have to recognise and support this land need. In our decision-making, the benefits from decarbonisation have, at very least, to be given appropriate weight in relation to other factors. There is a whole value chain of issues when it comes to the energy sector and its relationship with land. We recognise that the pressures on land are growing, but the energy sector's demand must be met, I am afraid, if we are to meet our climate targets.

The energy security Bill, which was announced in the Queen's Speech the other day, will provide some of the nuts and bolts of the policy to try to lead us to that point. Ultimately, we are moving to a position where the only way to reduce the infrastructure demand in the energy sector is to reduce demand wherever possible, for example through energy efficiency initiatives or insulating people's homes. That is something the Government have not been so willing to move into wholesale. Quite simply, it would mean less construction. It is always more expensive to build new infrastructure than it is to bring energy efficiency to existing infrastructure.

Ultimately, we are in a position where we will require significant amounts of new infrastructure. Some of that will be retrofitted or built on land that already houses existing energy infrastructure, but much of it will not. Although the footprint is not massive, it none the less requires a lot in policy reforms, planning applications, commercialisation and financing solutions for the technology, and engaging local communities and making sure they benefit from projects such as this.

Professor Rob Gross: I represent an academic consortium called the UK Energy Research Centre. I have no particular vested interests other than a desire for societal betterment and to meet the targets for net zero. We are funded by the research councils, so we are funded by government, but we do not do what government tells us. We try to be a critical friend.

We go completely across the whole piece; we are interdisciplinary. I tend to focus on some of the things Adam was talking about—electricity market design, innovation support and so on—but I have colleagues who work on biodiversity net gain, societal preferences and all those kinds of things. I cannot always represent everything that they all think, because we are a bunch of academics. By definition, we do not agree with one another about everything.

I broadly agree with much of what Adam has said. There are a number of ways in which we could rise to the challenge of net zero, but almost all the scenarios that have been developed see an expanded role for electricity. I think Adam made a slight slip of the tongue when he said that we will need more energy. We are not necessarily going to need more energy; in fact, it would be good if we were able to use less energy, but we will need more electricity. There is a reason for that. If you want

to reduce CO₂ emissions—by the way, you can also reduce your reliance on gas imports and, I hope, make things cheaper in the long term—you need to use electricity in sectors where we currently use fossil fuels directly. That is mainly heating, transport and industrial processes.

If we are to do that, we need to get that electricity from somewhere. That means we need more renewables. We can have a conversation about nuclear power, but the Government have an aspiration that a fraction of that will come from new nuclear power stations. They envision that it will be a relatively small fraction, because the economics of renewables have improved so much that it looks more desirable and perhaps easier to try to go down that route than to build a swathe of new nuclear power stations. All these things have choices and trade-offs.

As a number of contributors have already said, we really need to get on with this if we are to get anywhere near the UK playing a role in trying to avoid dangerous and runaway climate change. We cannot prevaricate or wait for the innovation fairy to deliver some as yet unimagined solution to all our problems. We really have to get on with this now.

The land use implications for that, in my view, depend on how much you want to do with onshore wind and solar farms. There are choices and trade-offs there. I would underscore one other need. We need network infrastructure to be upgraded. We already have wind farms behind constraints. We cannot get the electricity from where it is windy. If you have wind farms where it is windy, you can make electricity more cheaply than where most people live, from the Midlands southwards into the south-east of England. That is just nuts.

That is not about taking away from productive land use or any of the complicated trade-offs. That is something that we really ought to be able to fix. We will also need to upgrade local electricity networks, for example, to have the wherewithal to have lots of electric heating or electric cars.

The Chair: On-land wind farms do not use a huge amount of land, because you can grow crops between them. Solar panels are different, because they occupy quite a large amount of land. There seems to be a dichotomy. Very large solar panel arrays, over 100 hectares, almost always get rejected on planning grounds, but the infrastructure cost and the infrastructure land use for running a large array are much less. If you have lots of small individual arrays where no one can see them—on top of hills, behind woods or wherever it might be—that is much better for planning purposes. It is probably better in land use terms, not competing with food, biodiversity and so on, although solar arrays can be quite good in biodiversity terms.

How do you compromise between those different problems? A lot of farmers, for instance, might want to have solar arrays on their farm for all sorts of reasons, but they cannot get permission because there is no infrastructure to support them. If it was a very big array, they probably could.

Professor Rob Gross: There is also a fairly straightforward economic trade-off insofar as solar farms are subject to economies of scale. We have seen this incredible reduction in the unit price of the modules. That has resulted in an ever-increasing fraction of the whole being the cost of doing the installation.

We thought, 10 or 15 years ago, that we would see solar panels on every rooftop. Incentives were introduced to try to do just that. This came down, but initially there was a very high subsidy per unit of electricity generated. When those subsidies were reduced or removed, the economic driver was very strongly towards finding the biggest available bit of land where you could put as many panels as possible with a convenient grid connection. The grid connection issues are still there. There has been solar-driven distribution network congestion in the south-west of England, for example.

If we want them to be less conspicuous, more widely distributed and more integrated into buildings, we could push development in that direction, but it would likely be a more expensive way of doing things. That is probably the main reason why that has not happened. There is also stuff around grid connection, but that is probably the junior partner in the economics. If I am wrong, I am sure Adam will correct me.

The Chair: Could you use small rooftop developments to feed into a local grid, such as a village or a town? That does not seem to be something that is happening in this country.

Professor Rob Gross: It could be happening at a much larger scale. In a way, you can think about it as negative demand, in the first instance, on your distribution network. If you start to have lots of solar panels concentrated in low-voltage networks, you are more likely to run into distribution network management issues. They are basically designed for the voltage to drop off as you get to the periphery. If you suddenly build a medium-sized solar installation at the end of that feeder, the voltage will potentially rise and there will be distribution network management issues.

Those issues are not insurmountable. As I said, we will have to do new stuff with our distribution networks anyway. It is very varied as to the vintage, where they are weak and where they are strong. Demographics have changed over the years and so on. Those problems are not insurmountable. They are a challenge that we should rise to. That might help to overcome some of the difficulties and controversies that I know the committee is grappling with.

Q120 **Baroness Young of Old Scone:** I am getting increasingly worried about the distribution networks and some of the new networks for things such as hydrogen and carbon dioxide. They are doing exactly what HS2 has done, which is take the line of least resistance through the built environment and put pipelines through ancient woodlands and protected sites at an alarming rate. That is just a comment.

Let me ask my question. In common with other developments, energy projects are supposed to deliver a mandatory biodiversity net gain and, I hope, other environmental benefits. How much of a challenge is that? Is it happening?

Adam Berman: The mandatory biodiversity net gain process is already in motion through Defra, but what is striking, at least in our corporate membership, is the number of companies that are already doing it voluntarily. They are contributing significantly to nature recovery by combining low-carbon energy infrastructure with nature enhancements as part of project plans. For example, EDF Renewables has a site in Essex called the Longfield Solar Farm, which is predicted to result in an overall gain of approximately 79% of habitat units and 20% of hedgerow habitats. It is just a really strong example that shows that biodiversity net gain, particularly around solar projects, is already happening.

Is it happening across the board? No. Certainly we are very much in favour of a mandatory biodiversity net gain. There are pros and cons to it, in the way the process works. For the most part these are quite technocratic issues, some of which have already been discussed. One of them is about compulsory land acquisition, which can be quite problematic. We need further guidance to ensure that the public interest test is met for compulsory acquisition around net gain.

Developers are already seeing unintended consequences. Not so much in England at the moment but, for example, in Scotland, there is a growing issue with natural capital. Land is being bought up to be used as a nature-based solution for offsetting, which then prices anyone else out of the area. That is clearly a problematic issue. There are many opportunities, though. Nature-based solutions can provide the sector with opportunities for relieving the growing stress on land use.

We are at a point now where, although plenty of companies are doing this on a voluntary level, we have to think about the mandatory size. One slight question for me going forward is whether it is necessarily the right approach to have quite ad hoc and often quite niche projects on biodiversity net gain scattered around the country, rather than looking at biodiversity corridors, which can be really beneficial to the quality of the nature enhancement achieved toward biodiversity. You could then have local communities engaged as the stewards for these corridors.

There is a set of relatively technical issues, none of which is intractable, in this process. We will continue to work actively with Defra on them, but I would say that there are plenty of projects already going in this direction. For example, the issue was raised earlier, but when we move to nationally significant infrastructure projects, where appropriate and feasible, we need to come up with a system that both obliges biodiversity net gain and allows a certain degree of flexibility about what that can mean in certain projects, given the uncertainty and long duration of these projects. It is quite difficult, five or 10 years previously, to plan out exactly what the biodiversity net gain will be and exactly where it will be in the project.

Professor Rob Gross: I am not close enough to the detail of what the industry is or is not doing to add anything in particular to that. As an observation, first it is important not to conflate the concern about visual intrusion, which has been one of the most dominant reasons for the big amount of controversy, particularly about wind and solar farms and their impacts on biodiversity. Their impact on the landscape is quite significant and controversial; their impact on biodiversity is easier to mitigate.

My colleagues at Plymouth Marine Laboratory would be very annoyed if I did not mention that the marine environment is also relevant in this context. Offshore wind farms, certainly during construction, have a significant impact on the marine environment, causing disturbance. In operation, the situation becomes more mixed, because they provide a habitat and potentially a refuge area from fishing. Those issues need to be factored in.

I would be more relaxed about the network infrastructure and the pipelines cutting through woodland. When we are talking about distribution network upgrades, we are actually talking about digging the roads. We are talking more about the concern that this will be a nuisance, that it will be inconvenient and that people will not understand why it is being done. It is that last-mile infrastructure and those high-voltage lines that we will need to upgrade. That seems to be a very difficult thing to get done, but its land take is very small compared to, for example, roads or new housing.

Baroness Young of Old Scone: We have talked a bit about biodiversity net gain. Do you have any comments to make on other environmental net gain, none of which is mandatory at the moment—flood risk management, other sorts of carbon reduction, access, recreation or all the billion things that you can get from the uses of land that are beneficial to people?

Professor Rob Gross: There is a blurry boundary between what we do in pursuit of energy decarbonisation and what we might do to offset the emissions from our energy use. Some of the things that become the most difficult in terms of land use in Scotland, for example, are more to do with offsetting the unabated emissions than they are to do with abating emissions. Abating emissions is really all about replacing fossil fuels with cleaner or zero sources of energy. Offsetting is what you do when you are not able to do that. The focus of my work—this is certainly what Energy UK is interested in—is on abating emissions and replacing fossil fuels with zero-carbon options.

Again, 10 or 15 years ago—I keep saying that—there was a debate about the potential for bioenergy to play a much larger role in the UK than now looks likely, by which I mean domestically grown bioenergy. That is partly just because the technology options available to us have changed. We are more enthusiastic about the economics of renewables, which means that we do not need that so much. It is possible that it would become a bigger part of the conversation in the future, were our perceptions to change or were we to want to do negative emissions on a larger scale by

doing bioenergy with CCS. Then the issues become those that might be associated with forestry, monocrops and trading off biodiversity against pulling carbon out of the air with trees.

The Chair: Adam, do you have a comment on that last point about crops for energy—miscanthus and so on? How do you see that going? I have always thought that it does not seem particularly environmentally friendly in terms of the long-term picture. Maybe you see it differently.

Adam Berman: Geography is important. In the same way that we put wind turbines up only where there is wind, we tend to grow biomass and to do offsetting at scale, if we are talking about things such as reforestation, only in places where it is relatively cheap and relatively easy to do that. For example, the vast majority of the biomass that is used in the UK, or perhaps all of it, comes from North America. Again, when we are talking about the possibility of offsetting, to be realistic, very little of that will come from the UK because it is expensive, because land use issues are intractable. It is much easier to go to Brazil and talk about reforestation than to come to the UK and try to repurpose agricultural land into something that is rewilded, which you can use for some sort of environmental or climate credit.

We might foresee a future in which more biomass is grown in the UK than it is today, but realistically it is already being grown at scale and relatively cheaply in North America. It is then chipped and sent to the UK, and it is used at Drax's power plant at Selby, which is a significant generator in the UK of what is technically classed as renewable energy. It is very hard to see a situation in which that changes systematically. There is already an entire infrastructure that facilitates that, which includes, quite literally, tankers that are designed to take those wood chippings from continental America to the UK and specially designed trains that bring it on tracks to the power plant. Being realistic, we may see this at the margins, but I am not sure it will be a key area of concern.

The Chair: That is my view entirely.

Q121 **Baroness Mallalieu:** I will ask you about planning, if I may. First, how can the planning system, as it is, support our energy needs while ensuring delivery of biodiversity net gain and wider environmental net gains? What changes, if any, could help get better outcomes for nature? What changes would you make, if you could, to the planning system and, indeed, to others?

Professor Rob Gross: I will slightly swerve the question by pointing to other countries' experiences. There is quite well-documented evidence from other countries, going back to the mid-1990s, about the relationship between incentive design—that is the ability of local communities to take a direct stake in and to benefit from, in particular, wind farms—and the extent to which they get blocked up in planning. We do not have a time machine so we cannot go back and do things differently. Some of the things that were done in the 1990s and early 2000s were probably a bit generous in terms of the subsidy level.

The evidence says not so much that those countries—I am talking principally about Denmark and Germany—had inherently different planning systems, although they do have different ways of doing things; it was more that there were opportunities for local communities to see a direct benefit for themselves. I do not mean that the anonymous foreign-owned company building the wind farm also built a cricket pavilion on the local playing field, but that local people were able to take a direct ownership stake in a closed mutual fund, perhaps with a soft loan from a bank, which meant that there was a direct stake in that project, which enabled them to get behind it. That was the experience. It is really well documented in the social science and economic literature of Germany and Denmark in particular.

In some respects, it is not necessarily that the problem is inherently with our planning system. It is a bit of an adversarial way of doing things, but that is not unique. It is more to do with who has a stake in these things and is seen to benefit from them. The Government have made some noises in that direction. This is always then interpreted as bribing local communities to have things that they do not want. I noted James' comment that we do not have the luxury of time. Changing legislation takes time, and then you find that the outcome has all sorts of unintended consequences. I would really like to think about what we can do with the system that we already have, to take the heat out of it without it being perceived as bribery.

Adam Berman: Biodiversity net gain is a really good first step here. As discussed previously, the relationship between nationally significant infrastructure projects and biodiversity net gain is key. First is the issue of flexibility. These projects are an iterative process. They take a long time; sometimes they can take decades. There are details of the projects that cannot be confirmed at an early stage. That should not necessarily instigate the need for further consultations and further processes. Provided that the development can still achieve that mandatory 10% biodiversity net gain, there should be a degree of flexibility to allow that iterative process to take changes into account.

Further explanation is required on the proposed scope and status of the biodiversity net gain statement for nationally significant infrastructure projects. There is this new biodiversity market, which will need to be monitored by the Government to prevent landowners charging unreasonable prices. There is the question of streamlining the environmental impact assessment process, which could be done to better support nature recovery. Around all this comes the fact that planning is a messy process. It cuts across Westminster, local authorities, Ofgem, the Environment Agency et cetera.

At the moment, for example, from a climate change perspective, as has been said earlier, we are on a very strict timeline in terms of the projects needed to deliver on emissions reductions in time to meet our net-zero targets. We have called on the Environment Agency and Natural England to have a primary statutory duty on net zero, so that for anything they

are evaluating, any project they are looking at, net zero has to be at the forefront of their minds.

Equally, there are significant delays to permitting and approval processes, environmental permitting among others. That type of thing can be politically complex, particularly for central government to issue a mandate to local authorities to increase the resourcing of their planning department, for example. However, you could introduce an obligation for environmental regulators, across local authorities and beyond, to make decisions on environmental permitting in six months. At the moment, we are seeing delays that are two or sometimes three times those sorts of periods.

When we are talking about a net-zero power system by 2035, for example, the weeks and months matter. We are on a very strict timeline. That is why these mandates could be the type of thing that helped, even beyond the mandatory biodiversity net gain, to ensure that these projects move forward and, when they do move forward, that they are not done in a messy way or in a way that will go against our climate change and broader environmental targets.

Q122 Baroness Bakewell of Hardington Mandeville: What is your assessment of the system we have for democratic engagement in long-term decisions about energy needs? Is there room for improvement?

Adam Berman: It is an unenviable task. There are two ways to look at this. As was discussed earlier, it is not particularly appropriate for me to comment on the decision-making in Westminster, but a lot goes on in terms of local communities and how they engage with these processes. The first question is about the quality of democratic engagement at local level on what infrastructure needs to be built and where it should be. The second question is about democratic engagement on the benefits that can be accrued to local communities if these projects go ahead.

On the first question, which relates to where energy infrastructure should be and what is needed, the vast majority of renewables developers already do a significant amount of community engagement. Some of this is mandatory through the official planning process, but a lot is voluntary. Take National Grid's proposal for East Anglia GREEN, which is to build the onshore supporting infrastructure for offshore, particularly wind. This is a significant project that involves building out 180 kilometres of new high-voltage transmission lines and a major new substation. For this—it is entirely voluntary—there is a first round of community engagement literally going into village halls and community centres. There are webinars and speak-to-experts sessions before National Grid comes to its proposals. That input all feeds into it. They then come up with the proposals, and there is another chance for the community to get involved. That is all before the planning application is put in. That is just a nice example of where this is already happening to a significant extent.

There can be specific issues inherent in the planning system that curtail that. The key one in England is onshore wind, without question.

Developers wanting to build wind farms have an incredibly high burden of approvals and permitting, particularly community involvement and assent, before they can build. They have to consult the local community prior to the application, which simply is not the norm in the planning system as it currently stands, and have all objections resolved before that planning proposal goes in. Unlike other planning applications, you could have a single objector, or sometimes a very small number of detractors, against the vast majority of a community who want this particular wind turbine or wind farm in their community. That could prevent the entire project.

We need to find solutions to those specific issues for onshore wind. There are only very few pieces of legislation that govern that, particularly footnote 54 of the National Planning Policy Framework. There are also a couple of amendments to the Town and Country Planning Act, for example, that ensure that this very high burden of planning is done before any schemes can be approved. That is about what goes where.

On the second question about community benefits, again, at the moment there are government guidelines, particularly for onshore wind and solar, on how to involve the community and what the benefits might be. Lots of companies are providing this already. RES, which is a major renewables developer in the UK, has operated what it calls a local electricity discount scheme for about 10 years now, which quite literally provides rebates to customers' bills in a certain perimeter of a generating asset. They have 20 participating wind farms covering 4,000 households, and they paid out £750,000 in 2021 alone. That is very welcome, particularly at a time of a cost of living crisis. That ensures that the local community benefits from the scheme. That is one way of doing things. Octopus has a similar scheme.

The other way of looking at it is to try to make sure that any community benefit available is tailored to that community. The Dogger Bank Wind Farm, which was a joint venture between a number of major energy companies, is 130 kilometres offshore. It is a multibillion pound investment for the UK. The owners have committed to a sizable community fund, in partnership with the relevant local authorities. In the East Riding of Yorkshire, there is a focus on early years education and funding that is targeted on that issue. Similarly, there is a targeted programme on secondary school transition in south Tyneside.

As I say, there are already companies that are doing this. That said, we need to make sure that we have these targeted approaches that are helping communities when and where they want help. At the moment, for example, we currently have an effective moratorium on onshore wind. Even the local communities that want it and want to benefit from it cannot have it.

Baroness Bakewell of Hardington Mandeville: It would be better and we would move forward more quickly if every scheme was treated in the same way, instead of having a separate set of rules for onshore.

Adam Berman: Yes. The differentiation of onshore wind is fundamentally a political issue. It is not one of economics. It does not have anything to do with the energy system. It is because there has been a set of policymakers who, for the last decade, have systemically tried to ensure that onshore wind would be quite a difficult proposition. Perhaps there was good reason for that a decade ago, given public opinion on these issues, but that is not borne out today by any of the systematic polling evidence, which shows that the vast majority of people are in favour of them not only in principle but in practice in their local communities.

Professor Rob Gross: I do not have a great deal to add. There is no magic bullet that would make up for a democratic deficit. We have seen the scale of generation—this is the 50-megawatt rule, as was—and the size of unit swing backwards and forwards as to what is given over to the Secretary of State to decide. As Adam said, we have seen varying degrees of enthusiasm about how difficult we want to make it for onshore wind farms in particular. That is in the detail of the use of the existing framework. It is not about finding a new framework.

There is no magic bullet. If we could find a better way of engaging local communities that was somehow different from what we thought of before, not all our problems would go away. To speak to the remit of the inquiry, with a coherent strategic framework and plan these things could be worked through in a generic sense, in the same way that we have generic approval for nuclear reactors. We do not have to make each one prove every aspect of its case, because we do that in a generic way. I would imagine that that would be beneficial. The issue is whether that would require a five to seven-year lead time in order to get the legislative process in place when we are trying to do this in something of a hurry.

You could write innumerable papers about the case study of the political economy of onshore wind in England, the power relationships, the role of certain newspapers and all that, and how it became as contested as it was. We seem to have arrived at a place where the Government are much more enthusiastic about it, having effectively said in the 2015 manifesto that there would be no new subsidies for onshore wind.

The economics have changed. We are no longer talking about subsidising these things; we are talking about them being a potential bill saver for consumers, certainly with today's gas prices. There has probably been a significant shift resulting from that. As I said in my previous response, so much of this is actually outside the detail of what is in the planning framework. It is more to do with how that is used and manipulated by the actors who are involved.

Baroness Bakewell of Hardington Mandeville: Generally, the right questions are asked at the consultation.

Professor Rob Gross: There is a question as to whether you are making it more difficult for some things than others, which is Adam's point.

Adam Berman: Just to be very clear, onshore wind and solar are the cheapest forms of electricity generation bar none in this country. If you want to reach your climate goals, if you want to maintain or bolster energy security and if you want cheap bills, that is the solution. That is why it is frustrating when you have this political block to it. At the end of the day, both onshore wind and solar are incredibly attractive technologies. Although we welcome the proposals mentioned in the Government's recent energy security strategy to think about how a community benefits scheme might work with onshore wind, we are a little bit behind. We already have the community benefit schemes. They are already in practice across the breadth of the country. We know what works; we just need to be allowed to do it.

Q123 **The Earl of Leicester:** Does that include the embodied energy involved in making wind farms, taking them out and planting them 100 feet underwater?

Adam Berman: The life-cycle carbon costs are certainly different between onshore wind and offshore wind. They are slightly higher for offshore wind, for obvious reasons. None the less, they pale in comparison to the carbon costs of a new gas turbine in this country or new coal infrastructure, which for the most part is no longer a reality in the UK.

Yes, that is an issue, but, when it comes to this specific question, you cannot really bake the cake without breaking the eggs. They are very small eggs in comparison to the benefits of the cake that comes out of it.

The Earl of Leicester: You mentioned that you represent all energy producers. It sounds like renewables are your favourites. How are you representing the companies involved in gas and oil generation? Are we not getting too rolled over by the modern zeitgeist of renewables and jumping on a bandwagon?

Adam Berman: I spoke at the beginning about the decarbonisation that had happened in the power sector, which has led the UK's overall decarbonisation.

The Earl of Leicester: You said it was 44%.

Adam Berman: That is UK-wide. In the power sector, it is 75.6%. We have already taken out three-quarters of the emissions from the power sector. Much of that has been through renewables, but much of it has come through moving from coal to gas power generation. Gas has about half the emissions of coal-fired generation. For a long time, there has been talk about gas as a bridging fuel or a transition fuel, which would have a lower carbon cost than coal and allow you to increase your renewables capacity. It can be turned on relatively quickly and turned off relatively quickly, so it can level out some of those intermittency issues.

With the Government's energy security strategy and the situation in Ukraine, lots of people are re-evaluating the role that gas will play. Clearly, it will still play a significant role over the coming years, not just

for power generation but probably for things such as blue hydrogen or grey hydrogen, which is hydrogen created with natural gas, but the carbon from that is then captured and sequestered. There are several areas in the industrial and power sectors where gas is likely to be used.

The prices of renewables have shrunk to an extent that no one or very few people—perhaps Rob did—forecast 10 or 15 years ago. The economic case for gas is still there for certain services, such as what we might call the capacity market in the power sector, which is used to keep the lights on when we do not have wind or sun. However, it will naturally decline over time. Not only does that aid our bills; it aids our energy security and our climate targets.

I would not say that it is a myth or that we are too attached to the zeitgeist. We are heading in the right direction, but we have to be mindful that it will take some time to reach enough renewables coverage and, particularly, enough long-duration storage with batteries or hydrogen. You can store electricity created in very windy periods that are not periods of peak demand. Gas plays a strong role in helping with those periods at the moment, but that role will diminish over time.

The Chair: Adam, what is your view of the disorganised chaos in bringing the offshore electricity onshore on our eastern coast? It seems to me to have been a major upset in the whole movement of wind energy. A judicial review was announced just today about it all.

Adam Berman: This is the problem with the political understanding that offshore wind must necessarily be much easier than onshore wind when it comes to issues such as community assent. Let me be blunt. We have an offshore wind target of 50 gigawatts now. It is up from the previous target of 40 gigawatts, which was already going to be very ambitious. There were already people across the sector who were saying, “We are really concerned about this, and we really need the Government to put in place the right policies to reach that”.

This target lives or dies with the supporting infrastructure that enables it. There is simply no point having hundreds of offshore wind turbines off the coast of East Anglia if there is no supporting infrastructure that can connect it to high-voltage networks and distribute it into people’s homes. It is true that we are behind on where we would like to be as an energy sector on that transmission infrastructure. Part of that has been a political problem. It has been very hard to get the relevant policymakers on side and show them that, aside from the national benefits of this scheme, which are clearly many, there are also local benefits.

When you are building a new substation, for example, you can also get preferential rates for industry that is based around it, almost like a small cluster. These are relatively small-scale issues, but we have seen that this process has been slowed down not only by those community issues but just by the sector’s ability to ramp up quickly. In particular, National Grid, which is rolling out this transmission infrastructure, is proposing,

instigating and planning for new projects at a scale that it has simply never done before.

I would agree that we are not quite where we would like to be. We have congestion on the network as a result, which is inefficient. We need to make sure that, going forward, we have enough transmission infrastructure for the electricity we produce. It is a work in progress. Without it, we just will not reach our climate targets.

Q124 **Lord Borwick:** My question was on the multifunctional approach, which presumably is tremendously important in onshore wind and particularly in solar, if you are the sort of organism that likes living in the shade. I wondered whether electricity losses are a relevant part of the production process. If you manufacture electricity only a long way away from a consumer, you will get a lot of transmission losses. That is a big factor in your design of the infrastructure, presumably.

Professor Rob Gross: Transmission distribution losses are about 7% or 8% of electricity generated. A significant fraction of those losses are at the lower voltage levels, which is closer to use. If we step the power delivery up to high enough voltages, particularly if we use high-voltage direct current, we can transmit electricity over very large distances with relatively small losses.

This is relevant to the previous question where it is done in a piecemeal fashion, with individual offshore wind farms having to build and finance their own connection and with a lack of strategic planning, rather than having a strategic approach, ahead of time, to high-voltage transmission network needs. Incidentally, that could go both east and west across the North Sea. It could be done in a strategically planned way that connects us to our neighbours on the other side of the North Sea to the benefit of us all. Doing it in a piecemeal way, slightly ad hoc and bit by bit, is inefficient both economically and in terms of electron transfer. It is probably a bit of a misconception to think that we cannot do high-voltage transmission.

The Chair: For HVDC transfers, I gather you have to have a station costing about £500 million on either end in order to transfer the power back to AC from DC.

Professor Rob Gross: You would have to transfer it back from AC, but I would have to check how much it costs.

The Chair: It is pretty expensive.

Lord Borwick: Is the environmental aspect of the multifunctional approach an argument for onshore solar panels?

Professor Rob Gross: It probably applies in the marine environment as well. What goes on below the surface of the sea is out of sight, but we make extensive and multiple uses of our seas for fishing, resources, recreation and a whole bunch of other things. It is not necessarily an onshore wind and solar issue only; it is just more obviously so.

I would refer back to my earlier observation that we should not conflate visual intrusion and the biodiversity impacts of these developments. The visual intrusion aspect is in some respects more intangible yet more significant politically than whether we can provide for wildlife habitats and accommodate these things in a sensitive way.

Q125 **Baroness Redfern:** What do you see as the main research priorities for the energy sector to maximise energy security and opportunities for better outcomes for nature? We have heard about how offshore wind farms have fairly large land use implications, with cables running onshore and coastal installations, so there is a loss of land et cetera. I would like to hear from you about the opportunities that can be gained for nature.

Professor Rob Gross: I will answer the first part of your question initially. First, there are still fundamental research challenges in the physical and engineering domain of the energy system. We will find new ways of doing things better. We will be able to come up with new battery chemistries, to come up with storage media for hydrogen, and to think about how we operate and run our distribution networks. All these things are fundamental physical and engineering research challenges that we need to keep plugging away at.

Having said all that, we are at the “get on with it” stage. We do need to be using the technologies that are at hand now and not having a conversation that pushes it off into the middle distance in the hope that we might invent something that does not currently exist. It is very much an implementation challenge. There are research challenges associated with that. One of the biggest is the system operation challenge that has already been touched upon.

There is a little app or website called Electric Insights—I will send it through to you to look at—that tells you what the grid is doing all the time. Some of the time it is windy and sunny and it is going great guns. The swing fuel at the moment is gas, and gas is giving us this terrific flexibility. There is a real research challenge as to how we get that flexibility if we are no longer going to get it from gas. People talk about hydrogen, and there is a big interseasonal question around that, particularly if we do lots of solar. Inconveniently, it is not very sunny at 7 pm on a January night when we use most of our electricity. All those things need to be fixed and resolved.

To come back to the earlier question about who is for and against the transition, it is not so much the energy generators; they are just as happy having wind farms as gas-fired power stations. It is more the gas network operators that would be concerned about this transition. Perhaps we could take that one offline, because I am diverting from the question.

I am not an ecologist. I would be very happy to take that question away and see what we could do to maximise the biodiversity and ecology benefits from some of these developments and think about how they can bring the most net gain.

Baroness Redfern: That would be good.

Professor Rob Gross: I do not know the answer to that question off the top of my head.

Adam Berman: I would agree. There is a need to get on with it. The problem with energy infrastructure is that we need all of it. We need offshore and onshore wind, solar, nuclear, biomass, hydrogen and carbon capture and storage. We need the lot. The question then becomes how we make sure that there is joined-up thinking on this. At least for the next 10 and possibly the next 15 years, we know what the projects will be. We know what the offshore projects are, what the CCS clusters are et cetera.

The issue then is how you make sure you have a robust evidence base. At the moment, that can be quite difficult. There is a lack of readily available environmental information. That can often lead to the inclusion of quite unnecessary issues in the scope of environmental impact assessments. We have to consider the EIAs. There is an opportunity to streamline the process by creating industry-wide evidence bases, which could be particularly helpful in the context of nature recovery to increase the certainty of impacts and identify mitigation solutions.

An example of that already happening is the Crown Estate's Offshore Wind Evidence and Change programme, which brings together key stakeholders from the industry to share best practice, to share data and to facilitate the growth of the sector in a sustainable way that best protects and enhances the environment. You could see similar collaborative approaches being used across the sector.

There are all these things. There is research into further opportunities for local nature recovery strategies; there is some potential that research and data gathering could be considered as biodiversity net gain, as part of that whole package. There certainly are places where more joined-up thinking could be a bit more of a priority in order to realise those better outcomes for nature.

Baroness Redfern: There could be better trade-offs, as such.

Adam Berman: Yes.

Q126 **The Chair:** It has been put to us that we need a framework for land use that balances the need for food, energy, biodiversity, landscape et cetera. Do you have any thoughts about how such a framework might exist? This is in relation to the energy sector. Should it be top down or bottom up? Where do the two meet in the middle? Is it regional, district, county et cetera? How would you see such a framework working? Is it a good idea?

Adam Berman: I am happy to start off and probably give a rather frustrating answer. As the energy sector's industry body, we do not have an established position on a land use framework. The reason is the complexity of the system. It could work better, but for the most part it is

working. We see new renewable energy projects coming online and being connected to the grid; we see new transmission infrastructure being built.

Is everything being built, delivered, permitted and approved quickly enough? No. That is because of the various institutions that govern the different areas of planning and environmental management. I am afraid I come to the point that perhaps all the speakers today have somewhat aligned on, which is that the clock is ticking. We have a system that is broadly working but could do better. As an industry, we are quite concerned about solutions that represent a wholesale change to a system. We tend to be more in favour of evolution than revolution.

I gave that example earlier of offshore wind living and dying with the network that is used to enable it. For projects like that, we know where we need to be in just 13 years, which is a net zero-compliant power sector. My worry is that we spend three, five or eight years considering, debating and legislating for such a framework, and that by that time a lot of the key bits of infrastructure have gone through or are going through this process and we then see a wholesale change in how that works.

I acknowledge that we have further to go when it comes to things like biodiversity and nature, but environmental land management schemes already exist and are likely to be linked to that biodiversity net gain. When it comes to the broader question of land use, I am sure that in principle a framework could be a sensible thing. It is really just a question of whether it is pragmatic at a critical moment in the energy transition to bring about a wholesale change.

The Earl of Leicester: We know that the existing planning system is underresourced. Are you implying that it would become more efficient if we threw more resources at it?

Adam Berman: Resources are really important. Skills are also really important—quite literally, competence in understanding issues such as co-location. Co-location is a relatively new concept when it comes to planning. You are talking about a planning application where you might have a solar array co-sited with a wind turbine, on agricultural land or with battery storage. At the moment, the skills in the local planning authorities to try to evaluate these claims are relatively limited. That is not a critique of them. This is a new issue, and we need time to get these skills.

Resourcing is part of it, but then we have the basic feasibility of the NPS and the NPPF, which are ultimately the two overriding regulatory frameworks that determine the planning structure. Of course, there is also the Town and Country Planning Act. Marginal changes are needed to all of these, and we continue to push government on this. We continue to push government for statutory duties on the Environment Agency and Natural England to recognise net zero and all these sorts of things.

When you take these together, cumulatively they probably make up the type of change that you might envisage through a land use framework,

but it is not called that. It is just a series of minor changes across the spectrum of legislation on planning and permitting to try to incentivise an easier and quicker energy transition.

Professor Rob Gross: An industry association will be concerned about hiatus. It will be concerned about everything being thrown up in the air such that existing plans and investments are thrown into disarray or undermined in some way. It is perfectly understandable that Adam would say that.

Would it be a good idea to have a land use framework in England? Speaking entirely personally, I think it would be good if we did. The question is what you mean by that. If you want to put one in place, how do you avoid the upheaval and the hiatus that might be associated with it if it is seen as being a root and branch transformation? It does not need to be. There is a whole range of ways in which it could be conceived that would allow it to be implemented in a way that avoided what is already coming through the pipeline being paused and interrupted, which is the biggest concern that the industry and independent observers such as me would have.

There was a question about top down versus bottom up. I would argue very strongly that some aspects of our energy system need to be strategically planned. It is very difficult to have bottom-up design and delivery of the strategic electricity network that we need. Let us not forget that the network that we had was planned and built in the immediate post-war period. Its primary function was to deliver coal by wire. We now have a primary need to get wind by wire, and we need to wake up to that. We need to strategically plan a network that will enable that and give us options. If we want to do more onshore wind or offshore wind, less solar or whatever it might be, we need to create the option-creation value that the network could provide us with.

Land use, biodiversity, and the whole set of wider issues that are associated with wires, basically, should not be overplayed, because they are quite minor in comparison to some of the other land use concerns that I know this committee is grappling with, such as housing and roads.

The Chair: Thank you both very much. That was a good session. If you have any further points you feel we have not touched on, do not hesitate to write to us. We would love to hear from you.