

Environmental Audit Committee

Oral evidence: Enabling sustainable electrification of the UK economy, HC 1410

Monday 19 June 2023

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Members present: Phillip Dunne (Chair); Duncan Baker; Barry Gardiner; James Gray; Cheryl Mackrory; Jerome Mayhew; Dr Matthew Offord; Cat Smith.

Questions 1 to 44

Witnesses

I: Nick Winser CBE, Commissioner, National Infrastructure Commission; Joanna Campbell, Assistant Director, National Infrastructure Commission.

Examination of witnesses

Witnesses: Nick Winser and Joanna Campbell.

Q1 Chair: Good afternoon and welcome to the Environmental Audit Select Committee's first oral session in our new inquiry on enabling sustainable electrification of the UK economy.

We are very pleased to be joined today by Nick Winser CBE, who is a Commissioner of the National Infrastructure Commission. He is the chair of the Energy Systems Catapult and is also the Government's first Electricity Networks Commissioner—welcome, Nick. I also welcome Joanna Campbell, who is the assistant director of the National Infrastructure Commission. Thank you both for joining us.

Nick, could you explain, to the extent that you can, where you have got to with the report that you are undertaking for the Government in your role as Electricity Networks Commissioner, and the extent to which you are or are not able to discuss that before us in our hearing today?

Nick Winser: The report is on how we speed up from the twinkle in the eye to the commissioning of the assets, the construction of strategic electricity transmission. The report was commissioned by a previous Secretary of State last September and is with the Department for a final look, although it is an independent report. It will be delivered to the Minister on Thursday, so the timing of this meeting is slightly unfortunate in that sense. We have, though, consulted very widely—

Q2 Chair: Can I interrupt you? I assume that it will not be published on Thursday.

Nick Winser: No.

Chair: You will be handing it to the Secretary of State?

Nick Winser: It will be up to DESNZ when it will be published. They are considering that, and it is probably best for me to leave them to communicate that, because it was commissioned as independent advice to the Secretary of State and I feel I should honour that.

However, we have consulted very widely on it and lots of stakeholders have therefore been involved in discussions, so I am happy, at an appropriate point in this meeting, to touch on the headline areas of recommendation, if that would be helpful to the Committee.

Q3 Chair: Thank you. That is very helpful.

Joanna, could you introduce the role that you undertake for the National Infrastructure Commission and which is relevant to this inquiry?

Joanna Campbell: Thank you for inviting us in to talk to you today. As assistant director at the commission, I lead our work on energy policy. The commission looks across all economic infrastructure sectors, and my area is to lead and advise the commissioners on energy policy.



Q4 Chair: Perhaps I can start with a bit of a scene-setter. As the National Infrastructure Commission, you are charged with identifying the requirements to meet Government strategy and policy for providing electricity and, as the demand for electricity will increase very substantially as we decarbonise the economy, how that will be supplied and distributed to those who have demand for electricity. Could you give us an overview of the scale of that challenge?

Nick Winser: Yes. It is a large challenge. We have responsibility for looking not just at electricity but multiple sectors, in particular energy as a whole. We will be looking at the energy system and the infrastructure needed for the transition to a decarbonised energy system. Clearly, we are mindful that 80% of our energy needs are still met today by fossil fuels. The electricity sector is decarbonising much more quickly than the heat and transport sectors, as the Committee will already know. Your inquiries on this are, to my mind, absolutely vital and appropriate because the electricity system will be critical to the decarbonisation of heat and transport as well as needing decarbonisation itself. We are mindful that that means a transition of 80% of our energy use from fossil fuels by 2050. That means that we will see the need for widespread changes across the energy system.

The electricity system will be particularly important because of the substantial role of renewables as one of the easiest vectors to put in place to supply energy. That means that the roll-out of electric cars and heat pumps in particular will be very important. It will mean an increase in the amount of electricity demand because, as you know very well, the renewables programme has been moving ahead very strongly. We have seen a rise in the penetration of electric cars and significant debate about how to decarbonise domestic heating.

In a world of a renewable electricity system there are a number of issues, which I think we are going to discuss today, but to my mind the key ones are how to build them, how to connect them up and how to manage the quite different characteristics of the renewables that we will use compared with fossil fuels, replacing the storage that was on the system and which tended to be a coal heap next to the power station or gas under the North sea, how to encourage consumers to insulate their houses, change their heating systems and get electricity cars, and how to manage the flexibility of all of that. As a scene setter, I would say those are the key points.

I would add that we think digitalisation of the system will be important, if you would like to question us on that, and the role of moving through the regulatory process will be important too. Joanna, did I miss anything there?

Joanna Campbell: No, I think you covered everything.

Q5 Chair: Thank you. You have covered a lot of ground there that we will come back to in our individual questions, but the starting point for me is



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that we have had evidence in other areas of our work from a number of operators who are promoting projects, and they have been given huge delays before they can access the grid. Part of that, we are told, is because the current regulatory system operated by Ofgem has a queue, which in turn is because there is a very large volume of existing consents to connect in the pipeline that are not being brought forward.

Our colleague Chris Skidmore, who wrote the Mission Zero strategy but unfortunately is not with us at the moment, indicated in that report that National Grid has estimated that about 600 projects, with a combined capacity of 176 GW, are currently in the queue, which compares with the current capacity of 64 GW. That is more than double—nearly triple—what we have at present, waiting to get in. Does that tally with your experience?

Nick Winser: Yes. We are touching on my other report as Electricity Networks Commissioner, so if you do not mind, I might just say a few words on that.

The nature of the delays to get on the grid are well reported. That is our experience too, from talking to stakeholders. It seems to me that there are three separate issues here, which the Committee may want to think about in its deliberations.

One is the management of the queue itself and the administrative and commercial conditions that are part of the setting up of the queue and giving timescales to projects to come on to the system.

The second is about local connections. When I say local, this might be a matter of a few kilometres to get projects to the interconnected system. There are clearly quite a lot of issues around that. There are issues about connecting smaller projects to the distribution system.

The third issue is about building the integrated networks at both distribution and transmission levels. I am currently reporting to the Secretary of State on how to build the transmission part of that more quickly.

In the areas of recommendation—just to talk through the sequence of trying to build those networks—I think I am going to be talking about trying to get ahead of the signals for generation and demand, and a greater emphasis on strategic planning of the networks, because currently the networks are slower to build. Quite often, they start being built after some of the changes to generation and demand. I am going to be talking about trying to give much more public discoverability of how those decisions are made and how proposals are brought forward. I will be talking about how we can better explain to communities and individuals the rationale for how we make those decisions and the role of the national policy statements, which we wish to see kept up to date and reflecting Government policy. I will be talking about a different way of regulating, with economic regulation of the network companies. I will be



talking about community benefit. I will be talking about the stretched supply chain for high-tech equipment and the skills base.

I think probably sums up the areas that you might have expected. I will be saying that I think we can improve delivery by halving the process, which at the moment counts as about 14 years, down to around seven years, which would line it up much better with the delivery of major new assets such as offshore wind farms.

Q6 Chair: Is it part of your remit to seek to halve the planning time, or is that likely to be one of your recommendations?

Nick Winser: Yes, the test question was how we knock off three years from the 14, or ultimately halve it. The 14 years is only a notional number, by the way; in some cases it has taken substantially longer. When I have done my work, I have concluded that we have to be much quicker than 11 years. Knocking off three years is not enough: we will still have the networks too late and they will be inadequate. I am very pleased to be reporting that we think that the process should be done in seven years, because that lines up the changes with the networks. We think it can be done in seven.

Q7 Chair: Would that also line up with the Government's ambition to decarbonise the grid by 2035?

Nick Winser: Yes, in broad terms. The only reason I hesitate slightly is that quite a few of the projects are already in train, and some of those will continue to go through the process as it is today. It will take a period of time to put in place the process changes that I will be suggesting, so we will have a gradual transition. I hope the process will gradually speed up but, in broad terms, the seven-year delivery will allow us to get the networks in place fast enough that we get clean, cheap domestic energy to customers as quickly as possible, from a network point of view.

Q8 Chair: Thank you. We have looked at all sorts of forms of renewables, some of which have very significant delays in supply chains at the moment because of the increased competition internationally—all countries are trying to decarbonise their networks at the same time—through to different technical specifications. For example, the Government's Powering Up Britain plan is to have 24 GW of nuclear capacity by 2050. Assuming that the new nuclear plants will be co-located adjacent to existing nuclear plants, because that will be one of the quickest ways to get them through the planning system and that is what is happening at Hinkley and Sizewell to start with, is it your expectation from an NIC point of view that the grid will require upgrading to be able to cope with the latest versions of nuclear so they will need to be new builds? Or would it be possible with the existing distribution networks?

Nick Winser: The large nuclear power stations such as Hinkley will, by and large, need new connections. The Hinkley one is being built: as you travel down the M5 south of Bristol you can see the new T-pylon, which is



the Hinkley connection. Those large nuclear power stations will need specific new connections. I think that is true of Sizewell as well, although it is a while since I have looked at that.

As for the smaller modular nuclear reactors that are proposed, I think it would be fair to say that we do not know yet. Whether there would be network capacity will depend on where they are and how big they are.

Q9 Chair: The last question from me: have you considered the financial capacity to sustain the scale of investment required and the skills and supply chains necessary to build out the new networks required within any of your work? Or is that at a more granular level for National Grid to look at?

Nick Winser: In my work on strategic electricity transmission I will be coming forward with recommendations about how to engage with the supply chain, which is clearly very strained. The number of engineers and technicians who will be needed in this country to deliver this enormous transformation will also be covered.

As for financial capacity in terms of the networks, I think it is fair to say that with the right regulatory structures, we have not seen any difficulty for the network companies in attracting finance to invest in their operations. For generation and storage, it depends on each type of CfD or other mechanism to encourage their investment.

Joanna Campbell: Within the commission's remit, we certainly consider supply chains as a risk factor in the deliverability of other recommendations, but it is not within our remit to make specific recommendations about how to address the challenges.

Q10 Cat Smith: I have a couple of questions on regulatory governance.

The Chair has highlighted the delays in connecting renewables projects to the grid. To what extent is the existing regulatory and governance framework responsible for those delays? If it is, could you outline the issues and perhaps offer some solutions?

Nick Winser: Currently, the regulatory framework provides approval for three things: the need case for an investment; the design, because different connection designs have very different costs; and the efficiency of the solution.

Within the regulatory structure currently, Ofgem will consult and then approve. In the past, it was project by project, but more recently it has been on bundles of projects. I think that what is needed is a more system-wide approach to looking at the forward design of the networks, so I will be talking about that. There may be other parts of the regulatory structure that are worth commenting on.

Joanna Campbell: In 2019, the commission published a report on the regulatory framework for utilities, on Ofgem and the other utility



regulators. The key finding was that it was not necessary to throw the baby out with the bathwater—the system had worked well and it had generated investment in the system—but that it was not really set up for the period of significant transition that we have got to see in the electricity system.

The key crux of what we were recommending in that report was the need for further strategic direction to the regulators in their decision making about the areas that Nick has just talked about. What investment is necessary? That is the needs case part, and it is definitely Ofgem's duty to then ensure that the costs being incurred are efficient. We recommended a net zero duty for Ofgem, which we now see coming through the Energy Bill, and that is welcome. We also asked for a strategy and policy statement for Ofgem, and again we see progress on that. It is a matter of giving Ofgem the right powers and direction to ensure that it is able to make decisions about investment for both current and future generation. The potential for overspending is obviously there, and Ofgem has a duty to protect consumers from that, but we think there is a need for further anticipatory investment. From all the numbers under every future scenario, we see electricity systems grow by 50% by 2035 and well over 100% by 2050, so the idea that this infrastructure will not be needed is unlikely.

Q11 Cat Smith: You mentioned the amendment to the Energy Bill and the mandating of Ofgem for net zero. Could I push you further? What difference would that make to the way the energy regulator will make decisions about energy infrastructure?

Joanna Campbell: From my perspective, having a net zero duty gives Ofgem that clarity. We also felt that Ofgem needed a duty on resilience, to ensure that the network is resilient to the challenges it will face. Those two things are important. It is about giving Ofgem the direction to take decisions about what is needed and when it is needed, and encouragement to push that.

Nick Winser: Can I add to that? Looking back to the roots of utility regulation, which go back to the late 1980s or early 1990s, in energy there was quite an emphasis on regulatory design that reduced expenditure on utilities. Systems were not changing very quickly, and driving down operational and capital expenditure was probably quite appropriate at the time.

We have moved out of that phase now. We need to build a lot more capacity because the need for the networks has changed very quickly, and that means changing the way Ofgem looks at the costs that come from not meeting the net zero target—for example, the cost of congestion on the system if that is delayed—as well as just looking at the capital costs and driving them down. We need to take a broader view now.

Joanna Campbell: Can I go back to what Nick said about having a strategic plan? I think that is one of the most helpful things that Ofgem



can have: faith in a plan for what is necessary. That is the needs case, and Ofgem is just assessing the efficiency of the cost of delivering that needs case.

We saw Ofgem take a decision—I think it was in December—on network investment needed at the transmission level on the basis of the existence of a plan for connecting up offshore wind. We can see how the system can work effectively from that perspective.

- Q12 **Cat Smith:** Going back a bit to how Nick finished his answer, when we are looking at different models, should Britain perhaps be looking to follow the Danes with their redefining of the energy market as not for profit rather than as a market? A bit of a left-field question there.

Nick Winser: I don't think the National Infrastructure Commission has a view on ownership of the system, no.

- Q13 **Cat Smith:** Turning to the regulator's five-year business plan cycle for energy suppliers, does the pricing review process need to be changed to achieve the UK's strategic objectives for decarbonisation?

Nick Winser: The price control process of Ofgem with the network companies?

Cat Smith: Yes.

Nick Winser: As Jo said, our emphasis would be on trying to have a greater degree of strategic planning in that process and accommodating a degree of anticipatory spend rather than waiting for a very clear settling of what generation demand is going to be and where. That allows the networks to be built more quickly. I do not think it necessarily tells you anything about whether it should be a five-year review or not. What we have seen in the development of the regulatory process is that the reviews may well still be five-yearly, but they have lots of reopeners in them for changing circumstance.

I think the broad philosophical point would be that in a period of very rapid change, the system needs to have quite a lot of flexibility and future-looking to be built into it.

- Q14 **Cat Smith:** Is it appropriate now?

Nick Winser: I would say that it is evolving because of lots of reopening clauses in those price control settlements. It is evolving to be a much more flexible system. It is also evolving to have a much greater degree of strategic planning, which is what Jo was talking about—looking at groups of transmission investment. Both those themes are apparent. I think I may well be saying in my report that those trends, of more strategic planning and more flexibility in times of fast change, need to be driven further and faster.

- Q15 **Chair:** What you are talking about is a fundamental overhaul of the way in which the system works, both from a regulatory point of view—we



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have the Energy Bill coming forward—and from a physical point of view, on the ground. Given the pace at which we have made these changes hitherto, is this remotely feasible within the timetable we are talking about, or is it a pipe dream?

Nick Winser: The commission's view is that this is achievable, and we think that it is very important that we speak to that and encourage the process. This is a challenge, undoubtedly, but there have been major changes to our energy system over quite short periods. We saw a doubling of electricity demand in the 1950s; we saw another doubling in the 1960s. We saw a very fast transition from town gas to natural gas. These things have been done.

If I can give you an experience from my own career, when I was UK CEO of National Grid back in 2010, I heard myself saying, "Well, we are very positive about the amount of renewable energy we could accommodate on the system. We think we can accommodate up to 20%." I said those words, but we are vastly beyond that now. We should not underestimate how fast, with the right vigour and the right unleashing of our engineering and technical skills, we can go on this stuff. We have very skilled engineers and others who, in the right environment, can move these systems forward very quickly. I think it is doable. We need to get on with it.

Q16 Dr Offord: The Energy Bill, which has been mentioned, is currently going through its Committee stage here in the House of Commons. One of its proposals is the intention to introduce a systems operator and planner to manage the electricity grid. What effect do you think that will have on the infrastructure, planning and development?

Nick Winser: The inclusion of the FSO—the future system operator, as it is currently coined—is a very important development. It is worth reflecting that initial interest in that concept, a separate system operator, is a system that you see around the world. You see it widely in the US particularly, but many countries have that role.

The initial idea was all about realising that in a world of distributed generation and storage and demand flexibility, the ownership of the wires should probably be institutionally separate from looking at how you bring together the combination of large-scale generation, distributed generation, storage, demand flexibility and all the other elements. It was about creating an independent system operator, which would demonstrate to stakeholders and investors that demand flexibility, which we think is very important, and storage, which we also think is very important, were not being sterilised and taken out of the market by overbuilding of wires. That was the initial idea behind it. I think it is very important.

It now has additional benefits, as we see the picture evolving, that the future system operator has the ability to look at more than one energy vector. It is looking not just at electricity, but at the future of gas and



potentially at the future of hydrogen networks, the carbon capture or carbon dioxide networks that will be needed and the ability to think of these things together and come up with a series of network plans that fit together. As the Committee will know very well, what you do with hydrogen or carbon dioxide pipelines dramatically affects how the electricity network needs to evolve, and what you need to do with the current methane network. We do see a very positive contribution from by having an independent body doing work on multiple vectors that overlap in the energy space.

Joanna Campbell: There is a proposal out there for the independent system operators proposal from Ofgem to also have a regional role, so that the role at a national level is replicated at a regional level. We see that as important, especially when it comes to our future heat decarbonisation transitions and its role in supporting the networks, to develop that plan in tandem: upgrading the electricity system so it can supply heat pumps and, as we have mentioned already, electric vehicles while also creating a plan for the decommissioning of the gas network that is no longer necessary to the extent that it exists today. At a national level, there is an important role for an independent system operator, but there is also an important role at a regional level.

The other capacity is to capture industrial plans as well from the local authorities. Both roles are important for the future.

Q17 **Dr Offord:** How do you see the commission working with the systems operator—you mentioned renewables—particularly in ensuring that the electricity network develops at a pace that enables us to achieve net zero?

Nick Winser: The commission is due to produce its second national infrastructure assessment this autumn. The previous one was in 2018; they are produced every five years. We will be reporting on how, in our view, the energy system should come together, picking up all the things we have discussed so far, and we will be giving particular focus to three issues.

We will be looking at the future of domestic heating. We will be producing some work on trying to provide independent advice on how domestic heating should be decarbonised. We will be coming forward with plans—lines on diagrams, which I am very excited about, as you can see—of where we think the initial hydrogen network should be and where the initial carbon dioxide network should be. That is absolutely leading analysis, I think, and a vital debate because those things are very much needed in decarbonising our economy.

We will also be coming forward with a piece of work on the flexibility of the network, reflecting the discussion we had earlier about renewables. We will be looking at the dominance of renewables in the future energy system and how important they are, but reflecting that they are weather-dependent. We are therefore seeking to advise on how we will manage a



system where we have moved from a lot of fossil fuel storage to renewables, which are weather-dependent, and how we should make sure that we have enough hydrogen turbines, for example, and gas turbines that have carbon capture and storage. We are looking at how to promote storage and flexibility. We will be coming forward with those three things as part of an overview.

Joanna Campbell: To go back to the question on our recommendation around the system operator: as we have said, the system operator can look across those vectors and help to plan and efficiently manage that system of interconnected energy vectors.

Q18 **Dr Offord:** A concern has been raised that the operator will have day-to-day responsibility as well as responsibility for the strategic direction of the system. Do you believe that the day-to-day decisions could in any way overwhelm them or mean that they neglect the strategic priorities for the sector?

Nick Winser: I have a past in this area at National Grid. I was very passionate about the system operation function and enjoyed working there for many years. I think we are making exactly the right partition of the responsibilities. Combining three things—the system operation, the strategic, or how the energy system comes together, and the wires—was not helpful.

I am a huge supporter, as is the commission is, creating the independent system operator. I believe that the two responsibilities of system operation and strategic can sit very happily together and are synergistic. When you go into the control room—I hope the Committee has had a chance to do that, because it is always a real thrill—you can see the coming together of the whole network and the multi-vector aspects of it, which is very much a real-time version of the strategic plans. I think that they fit very well together and the partition is right, and that is also the view of the commission.

Dr Offord: It is good to hear someone with a passion for their role.

Nick Winser: It is the best place to work. Let me say that, in case young people are watching this.

Chair: I can confirm that we are very interested to go and have a look at it, but we have not done so yet. We will be in touch with National Grid very shortly to follow up your recommendation.

Nick Winser: I am sure they will be absolutely delighted to welcome you.

Q19 **Jerome Mayhew:** You have told us previously that to hit our targets, 17 major infrastructure projects would have to be consented to within the next four years or so to keep on the straight and narrow. Given where we are now, what is the chance of that happening?



Nick Winser: It is challenging. It is not out of the question, certainly.

Jerome Mayhew: Under current rules?

Nick Winser: Under current rules it is still not out of the question, but it requires a very fast mobilisation. It requires the Planning Inspectorate to be able to operate in timescales that have not been achieved recently, but there is some good news on that. I know from working with DLUHC on my own projects that the Planning Inspectorate has just recruited another 21 inspectors, which I thought was a pretty impressive number. The ability to process this work is important.

If I could focus a bit on how the planning system is working or not working at the moment, one of the things that both the commission's work on planning, which Jo can speak to in a second, and my own analysis have uncovered—it has been quite well reported—is that the pre-application phase of the planning system under the Planning Act 2008 is where timescales balloon.

I think there are some quite clear clues about why that is happening. The updating of the national policy statements is absolutely critical to this, because if the Planning Inspectorate is placed in a position of having to consider almost from start to finish the issues around network enhancement, starting with understandable concerns that communities and individuals have come up with about "Why net zero?" and everything through to the detail of the local plans, that is a long process. I think that is why pre-application is ballooning.

Bringing forward the update to the national policy statements by giving Ofgem new clarity on driving towards net zero can help some of those projects. I hope my own work, which as I said is about to be reported, will also help some of those things to speed up through the process.

Jerome Mayhew: I should make a declaration of interest, as the Chair has very kindly reminded me. I am a Norfolk MP, and offshore wind is being connected through both my constituency and Duncan Baker's, so I just want to highlight that we have skin in the game. I am also vice-chair of OffSET which is a group of East Anglian MPs who are particularly focused on East Anglia GREEN, which has now been renamed the Norwich to Tilbury line. I just want to put that on the record.

Nick Winser: The National Infrastructure Commission has just done a piece on planning, which is also relevant to your question.

Joanna Campbell: We published a report in April that made recommendations building on the Government's action plan on the planning system and setting out what the system needs to do to be fit for the future—both to manage what we are talking about today, which is getting the networks built and generation, and in other infrastructure sectors. It is not specific to energy. Nick has already mentioned the core things, such as having national policy statements that are clear and up to



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date and that therefore potentially reduce the risk of challenge where there is a bit of indecision or uncertainty about the decisions that the Planning Inspectorate should be taking.

We also recommended improvements to environmental data gathering, again to speed up the process, recognising that there are lots of individual organisations doing similar work and that there could be a different way of managing that to still create the same benefit if not more.

The final thing on your points is around community benefits and, clearly, the need to reshape what is done at the moment.

Q20 Jerome Mayhew: I will come on to that last bit. It is very important, but I am going to focus on that in a couple of minutes.

You have talked about having a central co-ordination oversight mechanism. Would that unleash the opportunity to make anticipatory infrastructure developments in a way that Ofgem, for example, has refused permission for previously?

Nick Winser: The principal benefit of having a more strategic view of how the energy system is going to develop would be the ability to establish need cases earlier and give more time to build the assets.

Q21 Jerome Mayhew: What does this say about Ofgem and its role? Or, rather more neutrally: how does Ofgem fit into this new system that you anticipate with your central co-ordination oversight? It seems to bleed into some of the roles that Ofgem has historically played. Do we need a new organisation, or is it a renovation of Ofgem that you have in mind?

Nick Winser: Taking a more strategic view of networks could be done in several places. Ofgem currently does give regulatory approval to the need case, pretty much, and it does so after regulatory approval, obviously. They still have to go through the Planning Act—or, north of the border, through the Electricity Act 1989—as part of their consent under that statute. They have these dual approvals now. In my view, if a more strategic approach were taken, Ofgem would need to be able to give comfort to stakeholders that that strategic process was being done in a way that was sensible, that represented value and that was in keeping with the remit of Ofgem, which comes back to the net zero remit.

Q22 Jerome Mayhew: That has only just recently been added to Ofgem's requirement. We have this already, don't we? It is getting on for a year since "Holistic Network Design" was published. That is meant to be, as the name suggests, the strategic look forward as to what kind of structure we need. We have a regulator in Ofgem that already has and historically has had strong value for money-type considerations. It has now had net zero added to it as a statutory objective, so why the need for this additional layer of central co-ordination and oversight? I am genuinely struggling to see how it all fits together.



Nick Winser: “Holistic Network Design” was a great step in the right direction. It was a one-off process, which has had a follow-up exercise, but we do not have a systematic drumbeat of looking at how the network should be developed as a whole. I agree with you that moving from individual project-by-project approvals to HND is a good idea. I think my work and the commission’s view would be that continuing the direction of that to have a drumbeat of systematic assessment would help to get ahead of the need case.

- Q23 **Jerome Mayhew:** On “Holistic Network Design” being a great step forward, I beg to differ. It calls itself “Holistic Network Design”, but it deliberately excludes East Anglia, so it was a misnamed document.

Bearing in mind what you have said, let us imagine that we have this central co-ordination mechanism, a perpetuation of the “Holistic Network Design” process. What scope is there for significant reduction in consenting times?

Nick Winser: If you look at the end-to-end process, you would be looking for a variety of reductions. They appear in getting the need case approved earlier, so you start earlier, and then shortening the pre-application process by giving greater clarity of the strategic rationale, through to the process carried out by the Planning Inspectorate. That would probably ease that part of the chain. I will certainly be talking about taking regulatory approval off the critical path.

Then there are several other delays that might well be addressed, which are about engaging with the supply chain, which is very stretched at the moment and which people are reporting as a major impediment.

- Q24 **Jerome Mayhew:** We have not mentioned communities—well, Joanna mentioned them in passing. Arguably, we are loading the gun against communities with the changes that you are suggesting, by making these kinds of applications nationally significant infrastructure.

You are trying to speed up the process. Well, another way of speeding up the process is to say, “We are not going to listen to people who are against it or who are adversely affected.” What is your suggestion for how we bring communities along so that these very unwelcome national infrastructure projects, which give them no individual benefit at all—very often they just have the infrastructure imposed on them—can gain greater acceptance in a much shorter timeframe?

Nick Winser: At the highest level, it has two components. It is about engaging much more deeply, respectfully, with communities and individuals. It is about increasing the engagement by explaining much better why the proposals are coming forward, rather than having to go to a community on each project and say, “There is a proposal for some infrastructure here.” It is deeper and more respectful engagement and potentially also, as DESNZ has just consulted on, community benefits.

- Q25 **Jerome Mayhew:** I am going to come on to community benefits as my



final area of questioning. On deeper consultation, one of the problems that we have had in East Anglia is that consultation has only dealt with a pylon route: "Do you want it left a bit or right a bit? But you are having a pylon route!" That is how it has been received, when alternatives—an offshore transmission network or offshore connectors, for example—have been considered in internal documents and then specifically excluded from consultation. Is that the kind of consultation that you do not want to have in the future, if you are serious about speeding up and gaining local acquiescence?

Nick Winser: I think that the more comprehensive and transparent the information that is provided to communities, the better that process will be. This is certainly not about removing the opportunity for individuals and communities to object. It is about basing it on a much more comprehensive and respectful process.

- Q26 **Jerome Mayhew:** I am very glad to hear that. Do you think that that process should include the genuine costings of alternative solutions? For example, with pylons it is possible to underground them and on other occasions it is possible to take them offshore, if it is near the coast. Inevitably there are cost consequences associated with that. Is that the kind of information that you should be providing as part of your consultation to communities, so that they can judge the relative cost-benefit analysis of this or that level of intrusion, as opposed to other solutions?

Nick Winser: I think that the process of making those decisions ought to be as transparent as possible. I think in some sense you might need to ask these questions of the transmission owners who are promoting these schemes, and I am sure you are. Looking to the future and how one might improve the process, I think the greater the degree of transparency and explanation of what we are trying to do and why, the better.

- Q27 **Jerome Mayhew:** I have shut you down, but now is your chance to talk about community compensation—I am just going to lump it in, in that way. At the moment we tend to do things such as having "voluntary donations", in inverted commas, by developers who then set up a scheme to which communities can apply as long as they fit the criteria that the developer thinks are important. That goes down very badly in local communities because, as they see it, it should by right be a compensation for the communities directly impacted by any negative infrastructure. Where do you think this fits? In your answers, could you at least consider the Electricity Transmission (Compensation) Bill of Dr Fox, a private Member's Bill that is going through the House at the moment?

Nick Winser: I don't have specific knowledge of that. I don't know whether you do, Jo?

Jerome Mayhew: Perhaps I should give you some. What it suggests, in



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a nutshell, is that there should be an alternative dispute resolution scheme set up to act as the honest broker between the Goliath of the developers and the Davids of individual landowners and affected communities, so that a mechanism for assessing compensation is given and it gives you equality of arms. That is what that Bill is suggesting, with a degree of Government support.

Nick Winser: I think I am right in saying that the commission, and certainly my own piece of work, has a view that is given context by the consultation that the Department for Energy Security and Net Zero has come forward with recently. Currently there are no broad guidelines that determine compensation for individuals and communities. There has been a consultation on that, and I think that consultation has closed. The commission believes that compensation of individuals and communities is a positive thing. There is a consultation out there. There are a variety of questions posed, among others about how it should work with individuals. Should you, as other countries have done, reduce people's energy bills? Should you give out community pots of money that can be used for various things? They all seem very relevant questions, which I think we are in favour of.

Q28 **Jerome Mayhew:** And the key issue of direct compensatory payments is one that you support?

Nick Winser: Yes.

Q29 **Jerome Mayhew:** Would your answer be similar for the relaxation of onshore windfarms? I am assuming it would be.

Joanna Campbell: Yes, we support onshore windfarms.

Q30 **Jerome Mayhew:** And the same approach to compensatory payments?

Joanna Campbell: Indeed.

Jerome Mayhew: In that case, let me hand back to the Chair.

Q31 **Duncan Baker:** I am going to come on to technological innovations and how we balance out the supply and demand on the grid. First, how do you see technological innovations playing a role in delivering smarter and more flexible ways of using our grid infrastructure?

Nick Winser: We see a wide variety of technologies being deployed already and being deployed as we go through the transition. There is certainly a lot of innovation to be done around them, but it is also fair to say that we are deploying some quite mature technologies. Offshore wind and photovoltaics are pretty mature technologies; heat pumps are a mature technology. The innovation is likely to come—I am referring slightly to my work at the Catapult here—in how you integrate these technologies together in a multi-vector, very different energy system in the future, rather than innovating on the large-scale carbon neutral technologies.



Q32 Duncan Baker: How do you use those innovations to balance the supply and demand needs as the grid changes? As you said earlier, the scale of how our electricity use has ramped up in recent times has been absolutely phenomenal. Using those innovations to cope with that supply and demand is what we are particularly interested in.

Joanna Campbell: The system we have now, as Nick said, is that we already have a significant number of batteries and interconnectors. We need to upscale the level of ambition and the level of delivery of those. What we need to ensure that supply and demand is balanced in future, in this system that is highly renewable, is technologies that can flex, so you can switch them off when the renewables are working well and providing the majority of our energy but switch them on when it is not as windy or not as sunny and we therefore need things to balance.

As Nick said, a lot of those technologies exist already. They are being deployed; we just need to get them deployed at a faster rate than is currently happening, with things like interconnectors, batteries, pumped hydro, demand-side response as well, so it has a similar effect on the demand side. Most of the technologies I have spoken about are on the supply side.

Where we need new technologies that we do not yet have—Nick mentioned this earlier—is with hydrogen turbines to generate electricity and gas enabled with carbon capture and storage, so still having gases on the system, but low-carbon gases.

Innovation is in a strong position. These are not novel technologies, so it is not as if we do not know how they work, but they do need support from Government to get them deployable in this country.

Q33 Duncan Baker: Is there a trade-off between building more network infrastructure and rolling out the technology that you are talking about? To the layman there is a perception that when the sun does not shine or the wind does not blow we are not able to store a lot of the electricity that is being produced. Where is the thrust going to come from? Is it from infrastructure or is it far more on the storage side?

Joanna Campbell: I would say it is both. We need a larger electricity system. We are going to be dealing with an increase of over 100% in demand by 2050, and 50% more by 2035. Under all future scenarios, we need to increase our network capacity, but the network can be used most efficiently if we have these complementary technologies to sit beside renewables, to offer that storage and that flexibility in how electricity is used.

Nick Winser: Can I give you my normal rule of thumb for this? Electricity is about 25% of our current energy system, so if you just do a simple sum and say, "We are going to decarbonise vehicles by electricity and decarbonise heating by mainly heat pumps," you could need an



electricity network, if you did not have any smart systems and smart homes, that is increased in size by four.

If you deploy smart integration, using digitalisation of how people use energy, how we operate, all the different sources of energy and the list of things that Jo talked about, you can reduce that to needing to double the size of the network. Those are very broad-brush figures, but this is just to give you a sense of how important it is not only to deploy these low-carbon technologies but to integrate them. This is a very important part of the picture, and that is where I think innovation is going to be extremely important.

- Q34 **Duncan Baker:** You have pretty much answered the last question we had to ask you, which is about what the best approach is. It does sound very much as though it really is, as Joanna said, a combination of the two, bringing in flexibility and innovation but also an expansion of the grid. The overriding fact is that you will only need to double it if you get the right technology in place to do that. That will be over the course of a lot less than 20-plus years, I suspect: it is over the next five or six years, is it not?

Joanna Campbell: Yes. The heavy lifting on the electricity system is to 2035. It is a relatively steady state from there to 2050. The heavy lifting is definitely in the next decade, or decade and a half.

- Q35 **Chair:** On digitalisation, what is your experience of the roll-out of smart meters for electricity consumers? Anecdotally, there seems to be quite a lot of pushback.

Nick Winser: I only have experience of it as a homeowner. I have had a smart meter fitted and it was all very smooth, and I have been fascinated by what the little read-out tells me, but how long has it taken to do smart metering? The commission would absolutely encourage the completion of the smart meter programme as fast as possible and the inclusion of half-hourly settlement, or shorter timescales of settlement. That promotes the ability to do that flexibility that we were just talking to Duncan about.

- Q36 **Chair:** At the moment, three-phase is 15 minutes and single phase is one hour. Is that right?

Nick Winser: Without a smart meter, we are still on three-monthly.

- Q37 **Chair:** For the general tariff, yes, whereas three-phase is at 15 minutes, is that right?

Nick Winser: A lot of industrials would be on half-hourly, I think, but I am way out of my depth on this issue. You would be best to ask somebody who is an expert.

- Q38 **Barry Gardiner:** I want to focus on energy efficiency. Last year, the Climate Change Committee helpfully produced its progress report to Parliament. You will recall that as part of that progress report it gave us a bar chart, going all the way through to 2050, about how we could achieve



that balanced pathway through energy efficiency improvements.

That was prospective, but we now know that in 2022 the number of energy efficiency improvements dropped 55% from the year before, to 204,100. Looking at that bar chart, this year we would need to have 500,000 energy efficiency improvements. That is two and a half times what we managed last year. In 2024, we would need quadruple what we had last time. In 2025, it would need to be six times what we had; in 2026, seven times; in 2027, 10 times; and in 2028, 12 times. We are not going to do it, are we?

Nick Winser: The commission covered this in its recent infrastructure progress review. In fact, I think it carried that very chart from the Climate Change Committee, which we thought was striking. The commission's view on this is that energy efficiency is very important and that we need to make faster progress, and I think we said that quite strongly.

Q39 Barry Gardiner: I think you said that the Government needs to develop, "credible policies for energy efficiency in buildings. Investing in efficiency now will provide meaningful reductions in the amount of energy wasted over the long-term and support the necessary transition to low-carbon heat." Motherhood and apple pie, really—come on! What would the National Infrastructure Commission recommend the Government do?

Nick Winser: We will be making specific recommendations in the national infrastructure assessment that comes out this autumn alongside our work on decarbonising heating, because we see those two things going hand in hand. It is no secret that we believe it is much easier to decarbonise heating in a sensible way if you make our housing stock much more efficient.

Q40 Barry Gardiner: You cannot do one without the other. If you are going to use heat pumps, you must have energy efficient buildings.

Nick Winser: I agree with you, broadly, but I would cite the work that has been done at the Catapult, which said that heat pumps can be an appropriate addition to a lot more houses, without changing the fabric, than had been advertised in the narrative in the industry. Also, energy efficiency is important in solving the flex point, because one of the problems with flexibility in the system is that the winter peak particularly is dominated by heat, very high increases in—

Barry Gardiner: Mr Winser, you are getting away from my question, and you are doing it very elegantly.

Nick Winser: Thank you!

Barry Gardiner: But I would like you or Jo to come back and answer it. Come on—specific recommendations that the Government need even to meet next year's targets.



Joanna Campbell: As Nick says, in the infrastructure progress review that we published in March—and, to be honest, in every progress review we publish, because it is an annual assessment of how the Government are doing against their own targets and against the recommendations from the commission that they accept—we have pushed on energy efficiency and said that not enough is being done. The funding being allocated to energy efficiency is not commensurate with the Government's own numbers on what it will cost to deliver their targets; more funding is needed for the not-able-to-pay market. We specifically said in the infrastructure progress review that the Government need to deal with the private rented sector and there was some ambition and some consultations from Government, but that has not been acted on. We pushed them to act on that.

As Nick said, what we are focusing on for the next assessment is the heat decarbonisation package. Energy efficiency is part of that, but there needs to be significantly more ambition from the Government on the heat pump roll-out. There is a widening body of evidence that there is a level of energy efficiency where a heat pump can work well. We do not have the time now to meet our sixth carbon budget by focusing purely on energy efficiency and there needs to be a change of tack to also think about that heat pump roll-out and the broader decarbonisation question.

Q41 **Barry Gardiner:** Let me put this to you. If we are going to move from 200,000 implementations to 2.4 million in the next five years, do you think we even have the skills base to do it? It is one thing to say that we need to accelerate the roll-out, but if you do not have the skills base to do it how are you going to do that? What steps are you recommending to Government to make sure that they do have the skills base to do it?

Joanna Campbell: That is a very fair challenge. I guess I go back to what I said at the beginning about the commission's remit. We certainly consider the skills base, but we do not make recommendations to Government specifically on that topic. Clearly, investing in a sector and ensuring that there is a forward plan and that long-term policy is in place gives the confidence to the installers, or the companies that train installers, to build up their capability. That would be our strongest line: give long-term certainty about the policy, invest in it, and then the private sector will deliver the skills.

Q42 **Barry Gardiner:** I am glad you mentioned the rented sector and the implications for that. I want to focus on people who own their own home and have the power to implement something if they see the benefit of it. Why do you think it is simply a matter of saying that the Government need to invest in it? Money is important and it is important to incentivise, but is it not also important to have a taper where the financial benefits are here at the beginning? Start with "Do it now, do it early, and we will give you the money to help" and then taper it off in future to "You still have not done it and now there is a penalty that awaits you." Of course, there must be financial benefits to the poorest to even that out, so there



is equal opportunity to do it. Why are you not suggesting to the Government a taper with a penalty at the end, whether that be through stamp duty or whatever comes at the end, that makes it incumbent on people to say, "It is in my interest to do it as soon as possible"? Otherwise, I do not see how in the next five years we are going to ramp it up by 12 times.

Nick Winser: I think it is fair to say that the commission has not come out yet with a comprehensive answer to your question on this. We have been very supportive of the need to do energy efficiency a lot faster. We are reflective of the history of this, the green deal and why that did not work. The commission may well say something much more specific that meets your challenge in the national infrastructure assessment.

Barry Gardiner: I will take that as a yes and pass back to the Chair.

Q43 **Chair:** This is a rather unusual question, but this is the first session that we have had on this inquiry. I am very grateful to Nick for opening by saying how important you think this is. As a Committee, we decided that this was something that kept coming up in our deliberations around the energy world and needed airing, and it coincides with the Energy Bill going through Parliament, so it is a timely opportunity. I am pleased to discover that you will be presenting your information in your report on Thursday.

Are there any things that we have not touched on that you think we should have done, or any points you would like to make to the Committee? This is an unfair question to ask you, but we make recommendations to Government—that is what we do. You are about to make a set of recommendations, and we are not going to ask you to pre-empt those, but are there any other things that are not in your report that you think we should be looking at or that we should be recommending?

Nick Winser: I think it would be useful for your deliberations to cover the development of the distribution networks. I think that is a major tension in the system at the moment.

Q44 **Chair:** Beyond electricity?

Nick Winser: No, in electricity—and, indeed, at some point the future of the gas networks will need to be considered. I think it is a point of judgment as to whether that is an important thing to do now. Certainly, the networks are becoming crucial in all of this. I hope my own work, alongside the commission's, will contribute substantially to the transmission system, but in the story around distribution there is clearly quite a volume of stakeholders talking about delays to all sizes of facility that connect at lower voltages. I would humbly suggest that you might probe that a bit, too. Anything else, Jo?

Joanna Campbell: No, I think that is a good suggestion.

Chair: In the same way that Jerome referred to his constituency, I



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should say in a slightly different way that I am very pleased that Zero Carbon Shropshire has given written evidence to this inquiry, because I know it is a subject of great interest to it.

Thank you very much for kicking off the inquiry with your oral evidence session with us today. Joanna Campbell, from the National Infrastructure Commission, and Nick Winsor, wearing your various hats, thank you very much indeed.