

Energy Security and Net Zero Committee

Oral evidence: [Keeping the power on: our future energy technology mix](#), HC 116

Wednesday 13 December 2023

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[Watch the meeting](#)

Members present: Angus Brendan MacNeil (Chair); Vicky Ford; Mark Garnier; Mark Pawsey; Lloyd Russell-Moyle; Alexander Stafford; Mick Whitley.

Questions 200 - 329

Witnesses

I: Angela Hepworth, Commercial Director, Drax; Richard Coulson, Chair, Wood Recyclers' Association; Philipp Lukas, CEO, Future Biogas; and Eddie Wilkinson, CEO, Melton Renewable Energy.

Written evidence from witnesses:

- [Wood Recyclers' Association](#)
- [Future Biogas](#)
- [Melton Renewable Energy](#)

Examination of witnesses

Witnesses: Angela Hepworth, Richard Coulson, Philipp Lukas and Eddie Wilkinson.

Q200 **Chair:** Good afternoon and welcome to the Energy Security and Net Zero Committee. This is our third session in our keeping the power on inquiry. Today we have a session on bioenergy. I see four witnesses in front of me and I will ask them, as I always do, name, rank and serial number, starting on my left.

Richard Coulson: Good afternoon. I am Chair of the UK Wood Recyclers' Association. Our members represent the entire supply chain for UK waste wood. We were formed in 2001 and our members represent over 90% of the volume of UK waste wood we process each year in the UK.

Chair: Excellent, thank you very much.

Angela Hepworth: Hello, I am the Commercial Director for Drax. We generate renewable power from biomass and we are looking to develop carbon removals from biomass in the future.

Chair: Thank you very much. I think we have heard of Drax.

Philipp Lukas: Good afternoon. I am the Chief Executive of Future Biogas. We are an anaerobic digestion operator running a dozen plants, injecting around 0.5 TWh of green gas into the grid in the UK.

Chair: Excellent, thank you very much. Finally, you have been stuck out on the edge there, I apologise.

Eddie Wilkinson: That is fine. CEO of Melton Renewable UK Ltd. We are quite a unique operation, a portfolio of five biomass power stations, unique in the nature of the fuel being land neutral, sustainable, UK-sourced biomass, including 500,000 tonnes per annum of poultry litter. We are also unique in our longevity. We have been in operation since 1992, with our first power station based at Eye.

Q201 **Chair:** Grand. Thank you all for coming here this afternoon. To kick us off I will probably start with Mr Wilkinson, because I have great sympathy for where you are sitting at the end of the table there. What role should bioenergy play in and outside of the power sector in 2030 and, say, 2050 as well?

Eddie Wilkinson: I think it is an important contributor to power generation and keeping the lights on, which is the subject of this Committee. Currently, as an industry, biomass contributes between 6% and 10% of demand. UK demand is somewhere between just under 30 GW and up to 50 GW. We are about 2.8 GW to 3 GW, so we are about 6.5% to 10%. We would like to grow that capacity. As things currently stand, we will be a diminishing share of UK power production based upon lack of support and lack of incentives, in reality, between 2030 and 2035.



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Chair: We will probably investigate that further, but just briefly from Philipp Lukas.

Philipp Lukas: What role should it play in the power sector?

Chair: Yes.

Philipp Lukas: Probably very little, because we make gas and it will be much more valuable, we think, to inject that gas into the gas network and use it for decarbonisation of heat, which thus far has been a trickier thing to do.

Chair: Fascinating, thank you. Angela Hepworth.

Angela Hepworth: I would say that biomass has a critical role to play in the power sector. The big benefit of biomass is that it can provide reliable, dispatchable renewable power, so it can provide the power that we need when the wind isn't blowing and the sun isn't shining. It plays a critical role in the system today, maintaining security of supply and enabling us to displace fossil fuels. One of the critical things about biomass is if we keep generating from biomass now, we can use it as a source of carbon removals in the future. That is what Drax is looking to do at its power station in north Yorkshire. We want it to be a source of carbon removals, taking carbon out of the atmosphere and putting it permanently underground.

Chair: Yes, I will touch on that in just a second. Richard Coulson.

Richard Coulson: Engineered removals is certainly important, but I see biomass's role in the future as essential. It is not only about the baseload power. Our members produced around 3 TWh of baseload from waste wood last year for the UK. It is not just about the carbon savings. We have equated that our sector, from waste wood alone, saves 734,000 tonnes of carbon compared to the marginal fleet. That could increase to 3.5 million tonnes with backers, but what sets us apart is that we are missing something, which the biomass strategy picks up. We provide a vital environmental service in making full use of the UK waste wood resource.

Q202 **Chair:** Thank you very much. Philipp Lukas, Angela Hepworth touched on the bioenergy and carbon capture and storage, but what regions and sites and scale of site do you think are well suited to the bioenergy with carbon capture and storage?

Philipp Lukas: In the case of anaerobic digestion, it will always be a much smaller industry in the size of its plants than biomass power stations. The material that we use, be it waste or be it grown crops, is generally produced in a very local proximate area and our material never travels much more than, on average, five to seven miles to the plant and then back to the field in terms of the fertiliser out the back of our digesters.



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As for carbon dioxide, we think that each anaerobic digestion plant—and we believe there could be several hundred built in the UK—could collect between 10 and 25,000 tonnes of carbon dioxide, which could be aggregated for sequestration. Very briefly, the anaerobic digestion is a bit like brewing. Instead of making alcohol and carbon dioxide—the bubbles in the champagne, if you like—we make methane and carbon dioxide, then before we inject the methane into the grid, we strip off the carbon dioxide, but as it has been absorbed the previous season by the plants it is biogenic CO₂ so it is a carbon removal if we were to take it for sequestration.

Q203 **Chair:** Angela Hepworth, you mentioned CCS or BECCS around presumably Drax in north Yorkshire. Do you want to expand on that a little more?

Angela Hepworth: We have our existing facility up in north Yorkshire with four biomass units. Our aim is to convert at least two of those to bioenergy with carbon capture and storage. We would like the first of those units to come online in 2030 and the second by 2035. It is a fabulous location for carbon capture and storage because we can be part of the cluster up in the Humber and Tees region and there is a brilliant resource in the North Sea to enable us to store the CO₂ permanently underground. With the existing power station there and such excellent storage resources, it is the obvious place to locate a BECCS facility and provide a source of permanent carbon removals.

Q204 **Chair:** How dispatchable would such a power plant be to add balance to the grid and basically to meet needs?

Angela Hepworth: If you fit carbon capture and storage and it becomes a source of carbon removals, probably you want to run the unit's baseload because its key function is as a carbon removals technology and you want to maximise the potential of the carbon removals. One of the great things about the Drax site is, as I say, we have four units on the site at the moment so you could have a perfect complement with two units of BECCS providing baseload carbon removals and two flexible biomass units sitting alongside them, which would provide you with your dispatchable flexible power.

Q205 **Mark Pawsey:** In August this year, the Government published their biomass strategy. I am wondering if each of you can give us your views on the strategy. What do you think of it? I will perhaps start with Mr Coulson and move along.

Richard Coulson: Our sector welcomes the strategy. The one important thing that it recognised is that biomass comes in all shapes and forms. It is not just about large-scale pellet combustion. It also includes waste, so we are very supportive of that. It recognises the role that bioenergy has to play and how the role can improve with BECCS. We particularly were supportive of the four key pillars that it introduces in respect of net zero,



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sustainability and resource management, which suits our sector. We score well on those criteria.

What we didn't appreciate is that there still is no clear detail there. The power BECCS business model has been removed away from our scale of fleet. We have about 50 plants in the UK, ranging in size from 1 to 65 MW, and we only have one option in our greenhouse gas removal model. The detail is not there. Some of the plants will drop out of the ROC regime in 2027 and urgent business decisions need to be made now to keep that plant online.

Q206 **Mark Pawsey:** What would you have liked to see that was not there?

Richard Coulson: We need some investor confidence, so we need clear detail on what the greenhouse gas removal schemes will provide and how they will operate. We are at the point now with some plant that it might be too late—

Q207 **Mark Pawsey:** You are waiting for Government to tell you what to do; is that what you are saying?

Richard Coulson: No. We have been lobbying long and hard for them to tell us what the business models are, the detail of the scheme.

Q208 **Mark Pawsey:** But you have told Government what you want?

Richard Coulson: I believe so, yes.

Mark Pawsey: They have not responded?

Richard Coulson: We need urgent clarity on what that model will be.

Q209 **Mark Pawsey:** What was your view of the strategy?

Angela Hepworth: We welcome the strategy. We thought it was an excellent overview of the role of biomass. It confirmed that biomass has a critical role in the power sector now, and it confirmed that going forward the priority use for biomass should be around BECCS. For us, that was excellent.

The key thing for us is seeing the next steps. The biomass strategy said that Government would be publishing further details on a sustainability framework. That is very welcome. We are waiting to see that and the follow-up steps with relation to getting BECCS confirmed and getting the contractual arrangements in place. We are looking for Government to confirm that we should be online as a BECCS unit in 2030 and to finalise the details of the business model.

Q210 **Mark Pawsey:** Does it provide the certain future that your company would be looking for?

Angela Hepworth: It provides the right vision for the future. What we now need is the practical implementation steps.



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Q211 **Mark Pawsey:** There is an outline, giving a direction of travel. Like Mr Coulson, do you want more detail?

Angela Hepworth: What we need is the follow-up, practical implementation steps in terms of agreeing the framework to support power BECCS and getting a contract in place.

Q212 **Mark Pawsey:** Mr Lukas, what did you think of it?

Philipp Lukas: We thought again the focus on BECCS was very positive. That is the future of any form of biomass use. We were very keen on the common sustainability framework because, as an operator, we are now moving into an unsubsidised world, so we are selling our gas with subsidy. As a result, we need rigorous sustainability evidence for our corporate customers.

We were a bit disappointed that there was a focus on perennial crops and not annual crops that fit into the rotation, in particular because we believe there is a huge opportunity there to help decarbonise UK farming. It could bring into UK farming cropping opportunities that on the one hand may replace some of the income lost to subsidy that has gone, and at the same time will help the journey of the farm to lower use of inputs—diesel, fertiliser, sprays—and to the formation of soil organic matter, soil carbon. Generally, anaerobic digestion as a tool to improve the carbon balance of the farm wasn't yet recognised in there.

Q213 **Mark Pawsey:** Did it look far enough forward for you? Was there more detail you wanted?

Philipp Lukas: There could have been more detail. There is still a binary approach to land use: it is either for food or for fuel. We think both of those need to be considered in the round, which is something we have taken up.

Mark Pawsey: Tell me what you mean by that.

Philipp Lukas: There is an opportunity in an annual cropping regime to use crops grown for anaerobic digestion and the digestate that comes out of the back of the digester to improve the organic balance of the farm, so soil organic matter, as well as to reduce, through amendments to the way that cropping is done, the use of diesel, the use of imported fertilisers, which obviously have a high carbon footprint and those sorts of things. That was missing from the biomass strategy. I will grant that that is something that is a relatively new approach. It is our business model that we have been pursuing now for two or three years and it is something we have been discussing with DEFRA.

Q214 **Mark Pawsey:** Thank you. Mr Wilkinson, your thoughts?

Eddie Wilkinson: It was a bit of a curate's egg, so good in parts and not in others. It was positive that it recognised the environmental benefits that biomass plants can provide in dealing with annual waste arising from, say, the poultry industry. Rather than getting it spread to land and



leaching into watercourses, the things that happened in the River Wye over in the west—that doesn't happen in the east because 500,000 tonnes of litter are managed by us, so it is well managed—and the propensity it gives to, say, avian flu, the disposal route for the litter is important in that regard. That was positive.

However, what it didn't go on to say is that it will be supported beyond 2027. At the moment that management tool will be gone in 2027 because the operating costs of a biomass fleet will exceed the revenue that it can receive. There is a gap there in terms of how that will be sustained beyond 2027. Yes, there are abatement revenues coming downstream in maybe the mid-2030s, but there isn't a roadmap or an opportunity to stay in business for those eight years or so between 2027 and the mid-2030s.

Q215 Mark Pawsey: Are you suggesting that the amount of biomass power will reduce because there isn't the—

Eddie Wilkinson: I can guarantee it will reduce because the subsidy isn't—

Q216 Mark Pawsey: By a factor of how much? How much do you think it is likely to fall between now and 2035?

Eddie Wilkinson: Power BECCS covers two out of about 54 power stations, granted there is a large power station that it will support, so that is fine, but the other 52 I would suggest will be uneconomic on a sliding scale between 2027 and 2037 as the ROC regime falls away.

Q217 Mark Pawsey: You are telling us that the existing biomass-generated power will fall out of use over the next few years because of the Government's strategy?

Eddie Wilkinson: Yes. I can guarantee our units will fall away come 2027.

Q218 Mark Pawsey: Does everybody else share that view, that the proportion of our electricity generated by biomass will fall over the next few years as a consequence of the Government's strategy here?

Richard Coulson: We should view the ROC scheme as a real success. It has built a fleet of modern environmentally compliant waste wood plants across the country to handle all UK waste wood, let alone the baseload power. We are on a cliff edge now. We have a great graph that shows the ramp-up of the plans and now there is no future, there is no support post-ROC on what will happen. That is what I tried to intimate in my last answer. We need the detail now to transition from one scheme to another and maybe transitional support. It might be too late for Mr Wilkinson's plants to make the investment decision and get the planning to install BECCS by 2027. We need some transitional support to get from ROCs to the future.

Q219 Mark Pawsey: Very quickly, Angela Hepworth and Philipp Lukas, do you



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share this view, that the proportion of our electricity coming from bio means is likely to decline?

Angela Hepworth: For Drax and other large biomass generators, Government have confirmed that they want to put in place transitional arrangements from 2027 to enable them to transition to BECCS. I am confident that we should have an arrangement in place that will enable us to continue generating at Drax.

Mark Pawsey: You see Drax continuing for many years ahead?

Angela Hepworth: Yes.

Q220 **Mark Pawsey:** Okay. Mr Lukas.

Philipp Lukas: I am not qualified to speak on particularly power, but on anaerobic digestion I think there is a good argument to say that on a post-subsidy regime for biogas for anaerobic digestion, there will be a continuation in many plants unsubsidised.

Q221 **Lloyd Russell-Moyle:** Ms Hepworth, given that the carbon release by burning woody biomass at Drax is unlikely—probably impossible—to be resequenced before 2050 and definitely not in the area in which the carbon was released, is the UK decision to support large-scale bioenergy sabotaging our efforts to achieve net zero in reality, no matter what it says on the paper?

Angela Hepworth: Maybe I can answer that first of all in relation to biomass and then in relation to BECCS. Biomass is counted as zero-rated carbon emissions at the stack and there are very good reasons for that. It is critically important—and this is a key point I wanted to make today—that people understand the difference between biogenic carbon and CO₂ that is produced by fossil fuels. If you are taking carbon from fossil fuels, you are extracting carbon that has been in the earth for tens of millions of years. If you didn't extract it, it would remain in the earth, but instead you are pumping CO₂ into the atmosphere. Now, if you are using biogenic CO₂ it is part of a natural carbon cycle. The material that we are using is a by-product of the timber industry. If that material was left in place it would either be burnt as waste or it would decompose in any event and the CO₂ would be released, whereas we can use it to displace fossil fuel.

Provided it is part of a sustainable forestry practice and the trees are regrown, the minute you start regrowing the trees, they are absorbing the CO₂ from the atmosphere again. That is why biomass now is counted as zero-rated at the stack because it has a neutral impact on carbon stocks. In the future we will be able to use our BECCS facility to take carbon dioxide out of the atmosphere via trees, via our power station, and store it permanently underground. The Climate Change Committee, the National Infrastructure Committee and the National Grid are all of the view that it is essential that we have carbon removals from BECCS if we are going to meet net zero.



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Q222 Lloyd Russell-Moyle: Carbon imported from wood abroad, you are right, it is treated as zero when it is imported and then at the stack. Does that not give a false equation of our national picture of being net zero?

Angela Hepworth: No. As I said, it is counted as zero-rated at the stack in terms of the carbon emissions, but there are supply chain emissions associated with producing and transporting biomass. In order to get the support that we get at the moment via the renewables obligation and the CfD, there are strict supply chain thresholds that we have to come underneath. At the moment the threshold is 200 kg per MWh and we are at 96. That is our total supply chain emissions. We are very transparent. All the information about our supply chain emissions is on our website. The key thing is to compare it with the alternative options. If you compare our 96g per KWh in total emissions from biomass, the equivalent for gas is around about 400. The equivalent for coal is over 1,100. Even taking account of our supply chain emissions, we are a very low-carbon option.

Q223 Lloyd Russell-Moyle: The supply chain emissions are accounted in terms of net zero, including the growing of the trees?

Angela Hepworth: We take account of the full supply chain emissions and publish details of the supply chain emissions. They are required to come under a particular threshold in order to get renewables support in the UK.

Q224 Lloyd Russell-Moyle: Just so I am clear, you are saying that it is not true that the import of trees from abroad is treated as zero for the purpose of the national emissions?

Angela Hepworth: Biomass as a technology is zero-rated at the stack, but the full supply chain emissions are counted where they occur.

Q225 Lloyd Russell-Moyle: Where they occur. So while we are producing demand abroad, they get the hit and we don't? It is not very fair, is it?

Angela Hepworth: If there are supply chain emissions that are created abroad, that is where they are counted. That is in accordance with international accounting practice.

Q226 Lloyd Russell-Moyle: But all your wood is from abroad, isn't it?

Angela Hepworth: The bulk of our wood comes from the US and Canada.

Q227 Lloyd Russell-Moyle: None of that then is counted as UK emissions?

Angela Hepworth: The supply chain emissions are counted where they occur and that is in accordance with international accounting practice.

Q228 Lloyd Russell-Moyle: Just answer the question rather than giving me waffle. Just say, "Yes, they are not counted as UK emissions". The waffle degrades you; it doesn't help you. Yes, that is fine. Thank you very much.



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Burning wood now with the idea that trees will be grown again in the future, those trees will not reach maturity for many years, maybe 50 or 60 years. Is that net zero in anyone's mind?

Angela Hepworth: One of the interesting things if you are looking at the impact of trees on carbon stocks is that trees absorb more CO₂ as they are growing than when they are mature. If you use material from forests and if you have replantation of those forests afterwards, from the minute you replant a tree, it is absorbing CO₂ from the atmosphere.

Q229 **Lloyd Russell-Moyle:** It is absorbing more CO₂ than you have burned? No.

Angela Hepworth: It is absorbing more CO₂ as it grows than when it is mature. If we step back and look at this at a forest level, I completely appreciate that using material from forests and using that in power stations seems counterintuitive. People worry about that, but if we look at the impacts of the forest industry and what has happened in the US, if you look back over the last 70 years or so, the use of forestry products has increased, but so has carbon stocks in forests. If you manage forests, they are more effective at absorbing CO₂ from the atmosphere and the biomass industry can play a valuable part in that.

Q230 **Lloyd Russell-Moyle:** Do you have a programme that you are monitoring to ensure that the forests are increasing where you are purchasing from?

Angela Hepworth: Yes. It is a requirement when we are sourcing biomass that we are able to prove that the carbon stocks in the forests are either neutral or increasing.

Q231 **Lloyd Russell-Moyle:** You can guarantee that for all your products?

Angela Hepworth: That is one of the requirements, for example, under the Sustainable Biomass Programme that we use for our products.

Q232 **Chair:** I will touch on this and I think Vicky Ford will touch on this, too. I think you had a subsidy of about £1.7 million a day in 2022 at Drax. You are the UK's single largest emitter of CO₂—the eighth largest in Europe—releasing something like 12.1 megatonnes of CO₂ in 2022. For a bit of context, it is double the UK's second-biggest emitter, which is Pembroke power station, which emits less than half of that at 5.3 megatonnes. You are still putting CO₂ into the atmosphere and that CO₂ will not be recaptured in the next 30 years, will it?

Angela Hepworth: In terms of the carbon impact, as I say, we are using carbon from sustainable biomass. So long as the impact we are having in the forest—

Q233 **Chair:** Yes, but the point is I know where it is coming from and those trees wouldn't do it in the next 30 years. The concerns that people have about rising CO₂ in the atmosphere is what is going in by 2050. This is the temperature rise. You are not doing anything about removing that



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CO₂. You are emitting 12.1 million tonnes of CO₂ a year into the atmosphere, which isn't coming out of the atmosphere anytime soon. It is like the CO₂ that is coming out of the gas-powered station as well. Isn't that correct?

Angela Hepworth: Maybe something that would help to put it in context is if I took a little bit—

Chair: But will that come out of the atmosphere? What you burnt last year, when is that coming out of the atmosphere?

Angela Hepworth: If as a result of managed forestry practices we are replanting trees or the forests are replanting trees, then from the minute those trees are replanted they will be absorbing CO₂ from the atmosphere again.

Q234 **Chair:** But shouldn't we be finding an energy source that is not burning and putting CO₂ into the atmosphere? Because the atmosphere doesn't care whether the CO₂ came from Drax or from, let's say, the No. 2, the Pembroke power station.

Angela Hepworth: No, the atmosphere and the planet really do care. They care because—

Chair: What, it can discern between your CO₂ and its CO₂?

Angela Hepworth: What you need to look at is the impact of the overall process. As I say, if you are burning fossil fuels, you are taking material out of the earth where the carbon has been stored for tens of millions of years and the net impact is to take carbon out of the earth and put it back into the atmosphere. If you are using carbon from forests, then you are using carbon that is part of a natural regeneration cycle and the impact is neutral.

Q235 **Chair:** Hold on. The carbon that is going into the atmosphere, where we are concerned about the global temperature rise in the next 30 years, whether that is being emitted by you or by a gas power station, it is still CO₂ in the atmosphere. Would we not be better trying to produce power and energy from non-carbon sources full stop, non-carbon emitting sources into the atmosphere? Whether you are burning it from trees that were grown a few years ago or trees that were grown millions of years ago, you are still putting CO₂ into the atmosphere.

Angela Hepworth: We need to make the most of all low-carbon energy sources, so biomass has a role to play as part of a balanced mix. We should be making the most of our resources of wind, solar and nuclear, but the point about biomass is it provides renewable power, low-carbon power, at times where the wind isn't blowing and the sun isn't shining. As I say, the carbon impact is neutral, so the carbon impact of using biomass is neutral.

Q236 **Mark Garnier:** Over what period? Hang on, there is a very important



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point. You keep saying it is neutral, but it is neutral over a specific period. This is the point, so what is the specific period over which it is carbon neutral?

Angela Hepworth: It is carbon neutral in the context of a continuous cycle.

Q237 **Mark Garnier:** No, no, no. You start today and you start pumping out carbon. You plant the trees and all the rest—I completely understand your logic, but I think the point we are trying to get to is how long.

Chair: Before that carbon is taken back.

Mark Garnier: It starts becoming zero carbon at a certain point once the trees have reached a certain maturity. What is the length of the cycle that gets it started? Because obviously once you stop producing it, the tree will carry on growing. What is the delay factor? How many years is the delay?

Angela Hepworth: I don't think I can answer the question in those terms because as soon as you replant trees they are absorbing CO₂ and when they are regrowing—

Mark Garnier: Somebody must have worked it out.

Q238 **Chair:** Some people tell me it is between 44 and 115 years. Would you agree that it is possible that it is between 44 and 115 years before that carbon is recaptured?

Angela Hepworth: That is not the way I see it at all because the trees are immediately starting to recapture CO₂.

Q239 **Chair:** You don't disagree with that, you just don't see it that way. There is a final point I just want to raise. Bloomberg had an interesting investigation into Drax, where it saw Drax was avoiding the CfD system—which would have returned £639 million to consumers, which they were due—by putting less production into an area that was producing under the CfD scheme and where production costs were capped. Instead it sold some of its biomass pellets on the open market, where prices were very high due to the high energy prices. Was Drax gaming the system, as Bloomberg seem to indicate?

Angela Hepworth: No, we absolutely were not. Again, if I give you the context for that, that was during the energy crisis. We were facing—

Chair: Yes, when you could game the system, if it was possible.

Angela Hepworth: —unprecedented circumstances in terms of what was happening to gas and power prices, but also what was happening to the availability in the price of biomass. During that period we had constrained biomass availability. We had hedged our ROC units in advance. The issue with the CfD unit during that period is because of what had happened to power and biomass prices, for substantial periods during that time it



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would have been uneconomic to run, but we always made sure that it was available to run if it was needed, if one of the other units had broken down or if the system was tight. When the power was needed from the CfD unit, we generated from the CfD unit. Over that period, we returned £45 million to consumers and we were the largest single generator of renewable power during that period.

Chair: £45 million is a bit less than the £639 million I quoted, but anyway, time defeats me. I will go to Vicky Ford. I might come back on it.

Q240 **Vicky Ford:** Ms Hepworth, please will you stop using this line, "As soon as you plant a tree, it starts taking carbon out of the ground"? We all know that the amount of carbon from a huge mature tree is infinitely higher than a little tiny sapling you have just planted in the ground, so let's just stop using that phrase.

You claim that Drax is only burning waste wood. "Panorama", *The Daily Telegraph*, CBS News, they have all had senior journalists show entire forests being cleared for this waste wood industry that Drax is part of. It is a scandal, isn't it?

Angela Hepworth: The bulk of the material we use comes from sawmill and forest residuals.

Vicky Ford: The bulk, not all. Thank you.

Angela Hepworth: It is something like 98% if we want to be specific about it. Last year 98% of the material we used came from residuals from sawmills and—

Q241 **Vicky Ford:** Where does that statistic come from?

Angela Hepworth: It is a statistic that is available on our website. We published—

Q242 **Vicky Ford:** It comes from you. Thank you very much. Now, in terms of how long it takes to replace the carbon from the trees that you have cut down, a Chatham House estimate put that period at 104 years. There are other analysts who say it is nearer 190 years. We need to reduce carbon this year, next year and every year up to 2050 to meet net zero. How can it be acceptable that you are getting the carbon reduction benefits now when the payback period is well past 2050?

Angela Hepworth: As I say, I can only reiterate that if you have managed forestry, it is a more effective way of absorbing CO₂ from the atmosphere. I would like to come back. You mentioned the "Panorama" programme and that was talking about the impact—

Vicky Ford: And *The Telegraph* and CBS.

Chair: Yes, okay. Let the witness speak.



Angela Hepworth: That was talking in particular about forestry in Canada. Last week I had the privilege to be out at COP and I was able to talk to some people who are in the Canadian forestry sector. The biggest threat to forests in Canada comes from wildfires. Last year Canada lost 19 million hectares of forest due to wildfire, so that is forest that is literally going up in smoke. We all saw on the news the impact that had on communities that had to be displaced, the smoke in the atmosphere and the carbon impacts of that. Canada needs to manage its forests in order to prevent wildfires from happening. It identifies how forestry can play a part in that and we are a very small part of that process, but managed forestry is critical to keeping forests as forests.

Q243 **Vicky Ford:** I absolutely get the need to manage forestry and to clear brushwood and create waste wood from that process, but later we will get on to whether there needs to be better regulation and monitoring of whether you are burning waste wood or burning virgin forest.

Your own advisory board, we have been told, has recently said that Drax should stop calling burning trees carbon neutral. Do you have a comment on that?

Angela Hepworth: Our independent advisory board is made up of academic scientist experts. What they said is that biomass per se can be carbon neutral. It depends on the way you are managing your forests. What they recommended we do is some more specific work to look at the impact of biomass supply chains on forests and that is the follow-up work that we are doing. They did not say that biomass per se cannot be carbon neutral, but they encouraged us to do more work on the impacts.

Q244 **Vicky Ford:** My understanding of what you want to do is continue burning the wood, which you say is from sustainable waste wood sources, and then take the carbon from that and deploy that into CCS, which you said is an excellent opportunity because your location is so close to the North Sea. If it is such an excellent opportunity, why in March of this year did you announce that you had paused your CCS development plans?

Angela Hepworth: Our CCS development plans are going at pace. We have already invested over £50 million in the development of BECCS in the UK and we are very much looking forward to having our first unit online in 2030.

Vicky Ford: Why have we been told that in March you said you had paused it?

Angela Hepworth: What we said in March was that we were looking forward to having more certainty from the Government and that in order to progress with our investment we needed greater certainty and clarity from Government about their intentions with respect to BECCS. The Government have made very positive progress since then in the development of their strategy, so we are confident that we will have our BECCS online in 2030.



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Q245 **Mark Garnier:** Angela, can I just go back to something you said right at the very beginning when you were talking about the dispatchability of energy from biomass? Clearly, it is very important and you made a very important point about wind and solar. As I understand it, there is 8 GW of biomass capacity in the UK, but at the moment only 3 GW is being used on the grid. Why is 5 GW of capacity of this great energy source not being used?

Angela Hepworth: I can only speak for Drax power station, but we run when the system needs us. There are times when you need more biomass on the system than others and that will depend—

Q246 **Mark Garnier:** How does that work? Because ultimately right now 46.4% of our energy use is gas, so we all agree we don't like gas, we all agree that gas is wrong. That is 19.6 GW of power, so we have 5 GW that could reduce that gas capacity quite significantly. The question is why. Look, I am slightly giving you a hard time and you are not responsible for the market, but can anybody explain why it is that we are using an extra 5 GW of gas when we could be using an extra 5 GW of biomass, if biomass is such a good product?

Angela Hepworth: I would agree with the principle that using biomass is better than using gas and we should be prioritising biomass generation ahead of gas. I can't speak to what is going on in the market that means that plants aren't being dispatched at any given time.

Q247 **Mark Garnier:** Can I just check that your CfD value is £139 per MWh? Is that right?

Angela Hepworth: In today's money that is about right, about £130.

Q248 **Mark Garnier:** The current electricity price is around £90. I appreciate we have to move forward with decarbonisation, but right now you are quite expensive.

Angela Hepworth: Right now it is above the market price, but Drax, in common with other renewable generation, is given a supplement to the market price. Yes, we are given payments in the market for generating renewable power, but so are other renewable generators. The market price is only a fraction of what it takes to deliver renewable on the system.

Q249 **Mark Garnier:** Sure. Sorry, can we get back to sustainability? Richard, why don't we chat to you for a bit and give Angela a chance to have a glass of water? On this whole issue of sustainability of the production of biomass, what are the processes for assessing if the biomass supply is genuinely sustainable? Is there a way that we can work this out? Yes, have a crack.

Richard Coulson: What I am conscious of is there are concerns over the sustainability of biomass, yes, and the issues that you have highlighted at the moment, the whole sector is tainted by those concerns. We welcome the strategy. There will be another consultation next year and they will



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look to strengthen sustainable claims. We are very supportive of that. Moving forward, the way we envisage that, it should be risk-based and proportionate. A one-size-fits-all approach will not work for everyone.

For our sector, for UK waste wood, domestically sourced waste, there are no Ofgem reporting requirements. There are DEFRA waste reporting requirements. We need to appreciate that some of the UK waste wood fleet will have to burn a proportion of forestry residues. The terminology is important. Drax does not burn waste wood. I represent post-consumer waste wood, material that has been used. Drax use preconsumer—

Mark Garnier: This is old plywood sheets, old pallets, that stuff?

Richard Coulson: Yes, a bit of furniture and the like. For domestic UK waste wood there are no Ofgem reporting requirements, but there are DEFRA environmental waste reporting requirements. Some of the fleet have to fire with a proportion of virgin materials. It might be a permanent requirement or an operational requirement. Where the fleet is using domestic UK forestry residues, the current Ofgem reporting criteria are sufficient enough in respect of the carbon chain, the location of where the materials come from and the material. If you envisage moving forward for our sustainability reporting criteria, if you count simple boxes to say it is UK waste, it is UK domestically sourced, there should be further criteria and further questions to answer to pacify these concerns because the public perception is tainted over biomass.

Q250 **Mark Garnier:** It is, you are right, and it has an implication on things like ESG-compliant governance. Is there an audit trail that checks all this stuff? I am deliberately giving you a break, Angela, but if you want to chip in, feel free.

Richard Coulson: We all have to do annual Ofgem reporting.

Q251 **Mark Garnier:** How is that audited?

Richard Coulson: It is independently audited. We use companies like Black & Veatch.

Mark Garnier: Okay, that is fine. The same for Drax, yes.

Eddie Wilkinson: We are not woody biomass, we are mainly poultry litter, which is animal bedding, straw and faeces. In terms of sustainability, in order to get the ROC support we have to prove it is biomass and we batch test everything that comes in and test the biomass content. It has to be 99.X per cent, so it has to be 100% biomass, effectively. In addition to that, in order to be sustainable, we are measured against Ofgem's sustainability requirements, where each consignment of fuel on aggregate needs to be less than 55 grams of CO₂ per megajoule of energy in that fuel. For the fleet I represent, we average about 12, so we have about 80% headroom against that. For the waste products such as litter, the answer is zero, because it is a waste



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product in the greenhouse gas calculation for Ofgem purposes. That is audited on an annual cycle by PwC.

Q252 **Mark Garnier:** Angela, because I am running out of time, just following on from the discussions you have had with my colleagues about this cycle, whether it is 40 years, 140 years or 1,040 years, if the Government were to suddenly turn around and say that wood cut from forests—or even waste wood, as we are discussing—had to be immediately carbon neutral, you would be in trouble, wouldn't you?

Angela Hepworth: As I say, our view and the Government's view is that burning biomass is carbon neutral today.

Q253 **Mark Garnier:** It obviously isn't. It is over a cycle. I completely accept the cycle, but it obviously is not day by day. Let's assume this is a 30-year cycle, and it is probably more than that, there will come a point. If you started doing this—I can't remember when you started, but let's say it was 2010—in 2010 and by 2040 it will be carbon neutral. We get that, that is fine, but if the Government turned around and said, "We are not happy with that. We are going to make it different on the cycle" you wouldn't be able to produce carbon neutral power if you had to be carbon neutral immediately.

Angela Hepworth: As I say, the right way to look at this is in terms of the impact it has on forests. If the impact today is carbon neutral or carbon positive on forests, then that is the right way to think about the carbon impacts.

Mark Garnier: Look, I do understand what you are trying to say but this language is difficult.

Chair: With respect, all we are going to get is her view on that. Vicky Ford.

Q254 **Vicky Ford:** I understand the Government rely on third party sustainability audits to try to understand whether or not the biomass is being harvested sustainably. What are your views—Angela, I will give you a break—on whether or not those audits are accurate enough, good enough, high enough quality? Do the Government rely on that too much? What are your views?

Richard Coulson: I can't comment whether they are or aren't today, but the debate suggests the perception is damaging us. There are concerns and those concerns need to be answered. With the sustainability consultation next year, that will be our recommendation. There needs to be robust certification to answer that perceptual question.

Q255 **Vicky Ford:** Angela, is your point that if you are taking a tree that had otherwise already fallen on the ground and is, therefore, going to rot into carbon now, then you might as well burn it? If you were going to take that tree and it is putting the entire forest at a risk of forest fire because the trees are all too dense and it needs to be cleared for firebreaks, then



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you might as burn it; is that your point and that is why it is carbon neutral now?

Angela Hepworth: You are right in saying the counterfactual, if you like, if we weren't using the material. As I say, I come back to the fact that what we are using is the by-product of the timber industry, so we are never the primary driver of what is happening in the forests. Before the biomass industry, a lot of this material was burnt as waste. Now, if you are going to burn this material, it is far better to use it to displace fossil fuels than to just burn it by the roadside where the forests are located.

Q256 **Vicky Ford:** What monitoring do you do to make sure that it is waste?

Angela Hepworth: People have talked about the reporting and the auditing that has to be done in conjunction with renewable schemes in the UK. We provide monthly and annual reports to Ofgem. Those are independently audited and almost all the material that we use is also SBP certified. The Sustainable Biomass Programme is a certification scheme that was set up specifically for woody biomass and it is very far-ranging in what it covers. It covers the carbon impacts and where the material is coming from. As I say, almost all the material is independently audited against that standard as well as the auditing we do before we submit information to Ofgem.

Q257 **Vicky Ford:** We have been told, according to the *Financial Times*, which I tend to trust, that Ofgem is currently investigating whether Drax is in breach of its biomass sustainability rules. Do you want to comment on that?

Angela Hepworth: Yes, I am very happy to. We have to provide a lot of data relating to sustainability to Ofgem. It is looking into the way that we have provided some of that data. It has already confirmed that there is no indication that we have breached any of our sustainability criteria, but it is just looking into the way that we have provided that data.

Vicky Ford: It would be helpful to get that from Ofgem, Chair.

Chair: Very good, thank you very much. We will move on to Alexander Stafford.

Alexander Stafford: You have had a tough time today, haven't you, Angela?

Angela Hepworth: That is quite all right. Honestly, I think that it is right that the power sector and our industry comes under scrutiny, so I am honestly very happy to answer questions.

Q258 **Alexander Stafford:** How are things going in Drax? How are profits?

Angela Hepworth: We run a profitable business, and as a result of having a profitable business we are able to invest in our plant and invest in BECCS.



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Q259 **Alexander Stafford:** It was very profitable last year, wasn't it? How much profit did you make?

Angela Hepworth: I don't have the numbers to hand, but we certainly did make a profit on our operations. Some of that money went back to the Government, though, under the electricity generator levy.

Q260 **Alexander Stafford:** I have the numbers here. I think you made £731 million profit in 2022, up from £398 million in profit in 2021. That is a huge increase, isn't it, coming up to double?

Angela Hepworth: We were able to increase our profits but, as I say, as a profitable business we are able to reinvest the money.

Q261 **Alexander Stafford:** No, it is good. As a Conservative, I am very pleased that you are making a profit, but my question is in that period where you almost doubled your profits, Bloomberg basically said you cut generation deliberately to exploit the loopholes to increase profit at the sake of cutting down production. That is great business sense, don't get me wrong, but your claim in your evidence today that you are doing all this out of the goodness of your hearts to increase security and low carbon, surely it is best to just keep burning the carbon, keep burning the pellets and make less profit, but better for the planet.

Angela Hepworth: The Bloomberg article was dealing with a period over the energy crisis and during those times the amount of biomass that we were able to access was constrained. As a result of Russia's invasion of Ukraine and what happened to gas prices and electricity prices, they had also put pressure on biomass markets. We were not able to source as much biomass as we would usually source, so we ran the ROC units. We had hedged those units in advance, but we had the CfD unit on standby and ready to generate power when it was needed. When it was needed on the system, it was generating power and it was returning money to the consumers.

Q262 **Alexander Stafford:** You are saying if you had access to more pellets, you would have burnt more; is that correct?

Angela Hepworth: For some periods during that time it would have been uneconomic to run the CfD unit, so if we had been running the CfD unit, we would have been running it at a loss. That is about what was happening with power prices, but biomass prices had escalated markedly during that period, too. We ran it when the system needed it, but if it wasn't needed, we were not going to run a unit at a loss.

Q263 **Alexander Stafford:** Let's just get this right. During the period, you—quite rightly, as a business—decided to not burn the pellets because you would make a loss of business, but when you could burn them, you burnt them again. I just find that quite hard, to go from the period where you are very worried about not being profitable, but in that same year you almost doubled your profits. Explain to me how that makes sense overall.



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Angela Hepworth: During that period electricity prices in the market rose and a number of generators were able to increase their profits. In response to that, the Government implemented the electricity generator levy and we were required to pay money back as a result. In terms of how we were operating during that period, we were just operating in accordance with the rules of the market, so we dispatched our units in the market, we got renewables obligation payments—

Q264 **Alexander Stafford:** I am not questioning that you are operating within the law in the market, but you were selling the pellets, weren't you?

Angela Hepworth: We were not a net seller of pellets during that period.

Q265 **Alexander Stafford:** That is interesting; that is different. I am trying to get to this point of what Drax, as a business, operate because what you have been telling the Committee today is that what you are doing, the whole idea is fundamentally trying to help the environment, to take carbon out of the atmosphere and provide an alternative security of supply, yet there are so many reports now that you are selling pellets. Your profits have doubled, coming up to close to £750 million in profit in that same period. Are you being honest with us when it comes to the purpose of the company and what you are doing or are you just taking from the UK taxpayer—everyone around this table, everyone who is watching on television—just for the sake of, I don't know, some profit?

Angela Hepworth: The purpose of the company is fundamentally to enable a net zero future.

Q266 **Alexander Stafford:** The purpose of Drax is to enable a net zero future, not to make money? I always thought the purpose of a company is to make money. Bear in mind you did have quite a large dividend to your shareholders last year. There is nothing wrong that, I am a Conservative, but you are either making a profit in your company and you want to make money, great, or your main purpose is to save the planet. What is it?

Angela Hepworth: Those two things are related. Our purpose is to enable net zero, to generate low carbon power and carbon removals. As I say, if we are going to get to net zero, carbon removals are essential. That is a key part of our mission. In order to do that, we need to be a profitable company because we need to invest. You have been talking about profits. Over the coming year we are looking to invest around £500 million in maintaining the power station and in developing carbon removals. It is by being a sustainable, profitable, growing business that we are able to make the investment we need to provide secure low-carbon power and carbon removals.

Q267 **Alexander Stafford:** You are saying you want to make this profit to maintain your power station because that will help the planet. Surely you are investing in your power station to make money. Once again, I have no issue with this, but you have to be honest with us about what you are



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doing. My big issue is from 2021 to 2022 you almost doubled your profits, at the same time as you weren't providing as much power and security to the UK, yet you are sitting here saying what you are doing is the best for the environment. I just want a bit of honesty from the company while you are here. We have already had answers today about what you are doing, about the fact—in your view—that out of the chimney it is carbon neutral. Clearly, it is not carbon neutral, frankly. Now you are not being straight on the purpose of the company.

Bioenergy and biomass—and this may be a question for everyone—what is the main purpose? Is it necessary or is it just purely another way of taking money from taxpayers for yourselves?

Eddie Wilkinson: To give Angela a little break, and back on the topic of keeping the lights on and net zero, on Monday afternoon, as per the Energy Dashboard, the UK was using 40 GW of power, of which half came from gas and a couple of per cent came from coal. If we are going to keep the lights on and get to net zero, we need to produce 40 GW of power. It will not be 223g of CO₂ per KWh now and zero tomorrow, there is a gradual process to get there, so what we need to do is get demand down and decarbonise the demand that we have. They are the two things we need to do. Forget wherever it comes from at this stage. The average on Monday afternoon of carbon into the atmosphere was 223g—it is an estimate, it is not measured instantaneously—of CO₂ per KWh, of which, as Angela mentioned earlier on, gas is around 400g per KWh, coal is about 900g, biomass is accounting for 120g, so it is surely better to swap out gas and coal, which are over the average, and swap in things that are below the average, which includes nuclear, biomass, wind and solar, which are all important, as is the dispatchable power.

I think that the focus of this industry and this group is to decarbonise and reduce the amount of carbon being pushed up into the atmosphere over time and then by 2030, 2035, if you can capture the CO₂ as well, you have a further reduction. Not every industry will get to net zero. Aviation is unlikely to, maritime won't, so if this industry can capture carbon, it offsets those industries that can't, so capturing that carbon is important. I think the target for 2030 is 5 to 7 million tonnes, which they probably achieve through power BECCS, but the 23 million tonne target of 2035 will not be achieved unless we start capturing CO₂ from biomass. Whether you like it or not and argue with the science, the way it is accounted for, we need to capture carbon from biomass.

The biomass that is already there will be diminishing and there will be less opportunity, so if you take my fleet, we could capture 1.5 million tonnes if the infrastructure was there and the market was there for the carbon pricing, but it isn't. The other thing that isn't there is any incentive for us to stay operating beyond 2027. You have focused on EBITDA and profit. Come 2027, my EBITDA and profit will be negative. At that point I will be switching off. I won't be selling pellets, I just won't be operating, because I will be making a loss to do so.



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Q268 **Alexander Stafford:** You mentioned EBITDA. What is your EBITDA this year or last year?

Eddie Wilkinson: Last year was roughly about £34 million, which was significant debt repayment.

Alexander Stafford: It does sound a very profitable business, getting involved in the pellets.

Q269 **Chair:** I will just check one thing before we move to Lloyd Russell-Moyle. You said in response to Alexander Stafford a second ago that you were not a net seller of pellets over this period. That would indicate to me it was a sleight of hand that you were maybe selling pellets in that period. Not a net seller, but there might have been periods when you were a net seller, but if you draw the time for a month rather than a year and a half or whatever, you might have been a net seller of pellets for part of that period.

Angela Hepworth: No, we were not a net seller of pellets, but—

Chair: Were you selling pellets?

Angela Hepworth: If you want me to get more details, perhaps that is what I can come back to the Committee with.

Q270 **Chair:** That would be grand, thank you. You had also said you could not make a profit on that. Just to check, your strike price was £139; is that right?

Angela Hepworth: Yes, and the issue is the difference between the reference price and the strike price over that period and how that compared with biomass prices, so that is the issue.

Chair: It would be interesting to see the price of pellets against that strike price, but I will happily accept some correspondence afterwards. Thank you. Lloyd Russell-Moyle, apologies. We will take account of this time.

Q271 **Lloyd Russell-Moyle:** It would be interesting to know how many pellets you normally buy, how many pellets you bought during that period and how many you sold during that period and then post so we can see, not netted off, what was happening there. I think the suspicion is that you bought/stockpiled and had pellets. You then did not need them or you realised you could get more, because there was a global shortage, by selling them rather than by burning them.

The other thing I was not quite clear about when you answered was that you said the CfD unit was not profitable, but you still burnt some of those pellets in your other units, didn't you?

Angela Hepworth: Yes, so the RO units were profitable to run during that period. The CfD unit sometimes was, but quite a lot of the time was not.



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Q272 **Lloyd Russell-Moyle:** Isn't the point of CfD that sometimes you will not get it so great, other times you will get it good, but you have a more stable fixed price? Therefore, you saying, "We are not going to do the CfD in the bad times, we will only take the good times" is a deliberate manipulation of the CfD, in principle.

Angela Hepworth: No. The point about a CfD is that it is intended to be a revenue stabilisation mechanism and to make sure that you always get the revenue you need to make a unit profitable. Now, if you are applying that—

Q273 **Lloyd Russell-Moyle:** Over every day or over the course of the arc of having that unit?

Angela Hepworth: The point about when it is applied to something like a wind farm, a wind farm is effectively a zero marginal cost plant, so it does not have a fuel input. If you set a strike price for a wind farm, in any conditions that wind farm should be profitable to generate. The issue with biomass is you have an input, which is the fuel, and that has a cost associated with it. If you set the strike price, if the strike price is set at a particular level and then biomass goes through the roof, then you can find that it is not economic to generate with that unit.

Q274 **Lloyd Russell-Moyle:** Yes, but the point of market stabilisation with inputs is that sometimes you will gain heavily because that strike price is much higher than what you would need in the market, but other times it is lower. Otherwise why on earth are we doing CfD in a market where you are happily burning with your other units?

Angela Hepworth: CfDs in general are intended to ensure that you can always cover your operating costs and make a reasonable profit.

Q275 **Lloyd Russell-Moyle:** Every minute of every day?

Angela Hepworth: With something like a wind farm that doesn't have an input fuel—

Lloyd Russell-Moyle: No, I get that. On every minute of every day you are meant to be making a profit on the CfD unit?

Angela Hepworth: The idea is that when you are generating, it should cover your costs and a reasonable operating margin. The issue with biomass is—

Q276 **Lloyd Russell-Moyle:** My question is: what timescale should you be making a profit? Every minute of every day that you are operating that unit you are meant to be making a profit or over the period of time of the CfD? Maybe I have misunderstood the CfD. I get that it is meant to make sure that it is stabilising, but are you saying that every single second an action that you take with that unit has to make a profit?

Angela Hepworth: The CfDs were never intended to force generators to operate at a loss.



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Lloyd Russell-Moyle: Not for any second?

Angela Hepworth: It is up to individual generators how they dispatch their units, but in general they are intended to ensure you can cover your operating costs and a reasonable margin.

Lloyd Russell-Moyle: Clearly, the CfD was made badly. We will have to ask the Department.

Chair: Annual profits seem to have been up, so—

Q277 **Lloyd Russell-Moyle:** Yes. One suggestion would be a recommendation that the CfD change there because clearly it is being manipulated. Look, one of the things that you have mentioned a number of times there is, quite understandably, that wood pellets are being traded internationally and sometimes the price goes up and sometimes it goes down. Just like when we had the natural gas crisis, wood pellets were affected in a similar order. Does that not mean that wood pellets might well be useful for other forms, but in terms of energy security they are just as vulnerable to market fluctuations and price gouging as gas?

Angela Hepworth: What matters to consumers is the overall price of generating using different technologies. We have had some work done for us by economic consultants, Baringa, recently looking at the cost of generating using biomass as opposed to other generation technologies. If our power prices stay at something like the same level and we end up with support after 2027 to continue to run our biomass generation units, then that will most likely save consumers money. The point is: how does it compare with the cost of generating from other technologies? Biomass looks like it will be a good option in terms of saving consumers money over the longer term.

Q278 **Lloyd Russell-Moyle:** How do you protect against market fluctuations? I grant where it is domestically produced, where it is waste material, all that area, whether it is pure waste material, post-use waste, I get it there, but with virgin or material that is from production waste, that is liable to market fluctuations.

Angela Hepworth: The best way we can protect against that is to lock in long-term contracts, so—

Q279 **Lloyd Russell-Moyle:** Do you not do that already?

Angela Hepworth: Yes, we do that already and we are looking to secure more supplies post-2027 on a long term—

Q280 **Lloyd Russell-Moyle:** How long are your long-term contracts at the moment?

Angela Hepworth: Oh gosh, I think that is another where I would need to get back to you. There are different contracts and different contract layers.



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Lloyd Russell-Moyle: I think it would be very interesting to know how long your contracts are for pellets, if you could get back to us. However, you do have long-term contracts at the moment?

Angela Hepworth: We do have long-term pellet contracts.

Q281 **Lloyd Russell-Moyle:** That means that you have locked in suppliers for long periods of time?

Angela Hepworth: Yes. As you can imagine, some of our contracting is done long term, some of it is done on spot markets. That is a commercial strategy for—

Q282 **Lloyd Russell-Moyle:** It seems strange then a short-term price fluctuation means you turn off the CfD system again, but you had long-term contracts in place anyway, but let's get the figures of that.

Richard, I would like to come to you, but others can answer as well. How much can we increase the amount of biomass that we are importing without driving environmental degradation in the regions producing biomass? Yes, I get that waste biomass does not have that, but there comes a point, doesn't there, where we are not producing enough waste to run, so we have to move to either virgin or imported? How do we protect from that meaning that we are not just degrading our environment?

Richard Coulson: In respect of the waste wood industry, and it applies to what you have just been discussing, we are producing the baseload power in a carbon-friendly way, but we have that environmental service. Each year the UK produces 4.5 million tonnes of waste wood. Last year, 2.7 million tonnes of that went to energy recovery, some with heat and power. We can't simply stop. We have to keep the supply chain and the wheels moving from our local rubbish tips to the factory wall. The wheels need to turn and the turbines need to turn. We are proven to offer that service, a reliable—

Lloyd Russell-Moyle: You have another 2 million tonnes of headroom.

Richard Coulson: No, because our membership of the Wood Recyclers' Association encompasses the whole industry. We have reuse and recycling outlets. The likes of the panel board industry consume 1 million tonnes. It will take some sawmill residues to manufacture chipboard MDF.

Q283 **Lloyd Russell-Moyle:** I see, so the maximum there is 2 million tonnes that you could provide?

Richard Coulson: The UK produces, on average, dependent on the economic cycle, around 4.5 million tonnes a year. Last year the sector consumed 4.3 million tonnes, so there is a spare marginal 200,000 tonnes. There is still the capacity in the UK waste wood biomass fleet to use that. It wouldn't produce a lot; it would produce about an extra third of a terawatt. What we could consider is that as we move out of the ROC regime and the 90% biomass threshold, we might be able to introduce



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other waste. Currently, England exports about 1.5 million tonnes a year of the likes of SRF and RDF.

One last important point, please. I am not sure we can rely on imports going forward. Last year we imported something like £11 billion worth of timber products, the third largest in the world. The World Bank has noted that timber demand will quadruple by 2050. What we should concentrate on is DEFRA's tree-planting plan and all Confor's good work. It has a target to plant 30,000 hectares a year. I think we managed 13 last year. We have resources at home.

Q284 Mark Garnier: Angela, if I may just bring the spotlight back on to you again, following on from an avenue that Lloyd has opened up, which is very interesting, this whole thing about the CfD. Let me get this right: you buy in at variable prices. Either it could be a spot price or it could be a long-term contract, but you buy your biomass pellets, your biomass energy, from an open market, be it either directly with producers or in the spot market. The CfD market was designed for those energy productions where there is no input cost in terms of what you buy. For example, if you have a wind turbine, you have a cost of development, but the wind doesn't cost you anything; ditto with a solar farm. Your model is very similar to a gas-fired power station where you are buying gas either on a long-term contract or on a spot price, where you are then selling into the market. How did you manage to get a contract for difference in the first place when your business model is typical to a gas power station, not to a renewable generator?

Chair: Good point.

Angela Hepworth: I guess I would come back to the fact that the situation in the market during the energy crisis was just extraordinary.

Mark Garnier: We will leave it there.

Angela Hepworth: In the normal course of events—

Mark Garnier: Hang on. What I am after is a fundamental question: your business model doesn't fit the CfD market at all.

Angela Hepworth: It had fit the CfD pretty well until we hit an energy crisis.

Mark Garnier: Only if you turn on and off.

Angela Hepworth: But there is an issue about the fact that we are different in terms of other forms of low-carbon generation because we have a fuel input price. That is something that is worth reflecting on in terms of the best way of supporting biomass.

Q285 Mark Garnier: All right. I have slightly missed that, but I do want to get to the bottom of this because it is a very important point. Eddie, I will come to you on different things, but it is a very important point. The CfD



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market does not fit your business model, so how are you selling into the energy market through CfD?

Angela Hepworth: The CfD has worked very well when energy markets were stable. The CfD did not work so well in an energy crisis.

Q286 **Mark Garnier:** The CfDs are designed for energy production where there is a cost of setting up that energy production but there is no input cost on the energy that goes into it. You could have two wind farms. An offshore wind farm costs more than an onshore wind farm and, therefore, you have to have a CfD that reflects the cost and a return on your capital. Sorry, I was an investment banker, which is why I am being boring about this. You got a return on your capital employed over whatever it is, a 10 or 15-year period, what everybody agrees on, and that is very predictable. Yours is a completely unpredictable model because you have a variable price of your input. That is the point. You are no different from a gas-fired power station in as much as you do not know what your input costs are, so your model—

Angela Hepworth: We are a—

Mark Garnier: Hang on a second. If you were taking in energy at a certain price, putting up a margin on it and selling it at another price, you would have a constant output, a constant profit, and that would be understandable. This is the point that we can't get our head around: how is it possible that your business model ever became suitable for CfDs?

Angela Hepworth: Biomass is different from gas in that we are undertaking long-term contracting, so—

Mark Garnier: You can do that with gas as well. You are running a treasury operation in terms of—

Chair: Let her answer the question.

Mark Garnier: Sorry.

Chair: Eddie wants to come in as well.

Angela Hepworth: CfDs definitely work for power generation sources that have zero short-run marginal costs. It can work for power stations like ours with variable input costs if those costs are relatively stable. It could also work if you had some way of adjusting the strike price in relation to the input fuel price. That is another way a CfD could work if you had an adjustment mechanism.

Q287 **Mark Garnier:** What we can't understand is why did the profit go up when you had high input prices?

Chair: Yes. That is the long and short of it, isn't it?

Mark Garnier: The long and the short of it. That is it, not long or short—



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Angela Hepworth: The units that were more profitable were the RO units where the power price was up.

Q288 **Chair:** You switched off your CfDs then. You decided not to play the CfD game when the price was high and then when the price was low you played the CfD game. That is having your cake and eating it.

Angela Hepworth: No. As I say, during that period we were the largest generator of renewable power in the country, so our priority is keeping the lights on.

Eddie Wilkinson: I think how it happened was when the RO scheme closed to new generation projects, the CfD was the mechanism for how the Government supported them and that is how you ended up with the CfD. That was your question, "How did you end up with the CfD?" The ROC wasn't available, so CfDs were provided. It is for other people to judge whether the system was gamed or not.

Q289 **Vicky Ford:** I think we are all agreed that it feels wrong that at the peak of the energy crisis Drax cut its production, but because of the way Government subsidies work through the CfD and other mechanisms, Drax's profits went up. Therefore, the way that the Government subsidy works through CfDs and other methods needs to be looked at again. Do you agree, Angela, yes or no?

Angela Hepworth: No. To be clear, we didn't cut our production. We were generating on the RO units. The CfD unit always generated when it was required and we were the largest provider of renewable power during that period.

Q290 **Vicky Ford:** I think that is inconsistent, from what I heard out there. Anyway, before I get to my main question, Philipp, we were also in a time of food insecurity and rising food prices. Does Future Biogas use edible food? If it does or might do, how do we make sure it doesn't use edible food and it is using waste products?

Philipp Lukas: We do produce less food in the UK than we used to, absolutely. That is largely because we import strawberries at Christmas.

Vicky Ford: Not the question. Do you use edible—

Philipp Lukas: Future Biogas uses whole crop maize, whole crop cereals. Future Biogas grows those on fields where in principle you could grow food crops. However, they are grown as part of a farming rotation and that is an important part of the benefits of anaerobic digestion. It is the opportunity to grow profitable break crops that help with cultural control of things like invasive weeds and—

Q291 **Vicky Ford:** Yes, you do grow edible food. Thank you very much. I want to get on to carbon capture and storage. How economically sustainable are the Government's proposed business models for bioenergy with CCS? Who wants to go first?



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Eddie Wilkinson: There isn't a market at the moment. Power BECCS is for units—

Vicky Ford: I can't hear, sorry.

Eddie Wilkinson: Power BECCS is for units above 100 MW, which restricts access to power BECCS, and you also need—

Vicky Ford: Is it only me? I am really struggling to hear what you are saying.

Eddie Wilkinson: I am saying that the current model, power BECCS, is only appropriate for anything above 100 MW. Anything below is ruled out and you have to be close to a pipeline, so there isn't a market at the moment. There isn't a revenue stream you can hang your hat on.

Angela Hepworth: On units above 100 MW, when we convert Drax power station, what Government have said is they will put in place a two-part contract for difference structure. There will be a contract for difference for the renewable power that we produce, but also for carbon. At the moment carbon removals, negative emissions, cannot access the ETS market. They can access voluntary carbon market revenue, but that market is quite small at the minute. The intention is that over time we will be able to get more of the revenue we need from the carbon market and the requirement for any Government support should diminish over time.

Richard Coulson: This is where we need clarity now. My members are in the exact camp as Mr Wilkinson's. We are handling 3 million tonnes of domestic waste. Once the ROCs phase out, I am not sure where that 3 million tonnes will go. I think Mr Wilkinson mentioned 600,000 tonnes of poultry litter. I am not sure you can spread that to land. We are trying to move away—

Q292 **Vicky Ford:** Do you want to re-explain that, Eddie, as simply as you can in language that I could explain to people down at the Dog and Duck? What is the problem?

Eddie Wilkinson: Every year the poultry industry—so the chicken that ends up in Asda or Tesco or Waitrose—produces litter. On a cycle, those sheds are cleared out and have to be dealt with. Every year, annually, the poultry industry for your broiler bird, which is what we eat, produces very roughly 1 million tonnes, probably a little bit less. We take over 500,000 tonnes of that, the arisings, and put it through our biomass units. If we are not operating, the ships with the wood pellets will still turn up at the dock or they won't, depending on the support mechanism. Whatever you do with that support, that litter will still arise.

The only issue will be if we haven't received the support we won't be there to take it, so you will have a lot of the poultry industry looking to where they will spread it. It will get spread inappropriately or it will get stored to wait for the land to dry out and be spread and there will be



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peak nitrogen runoff into watercourses and rivers. The rivers eventually will suffocate and die, which is what is happening at the River Wye currently.

Vicky Ford: I was trying to ask you about the carbon capture elements of this.

Eddie Wilkinson: We don't capture carbon at the moment. If we are still operating in 2035 and the infrastructure is there to do the transport and storage, we would invest in the carbon capture, capture it and store it. If we are not there in 2035 because we have not been supported, we will not be there to capture it and it is in the plan to close down.

Q293 **Vicky Ford:** I am guessing you are concerned about your financial stability now.

Eddie Wilkinson: Yes. We are keen to implement carbon capture, but we do not have the opportunity to do it now and will not have the opportunity to do it in the future.

Q294 **Vicky Ford:** What is the reason you are concerned now?

Eddie Wilkinson: Come April 2027, if I lose my RO support, my power station units will be uneconomic because their operating costs will be below the revenue they receive—

Vicky Ford: Because your RO support runs out in 2027.

Eddie Wilkinson: Yes, and we will not be there to capture carbon or generate power. That impacts 2.8 GW of production.

Q295 **Vicky Ford:** You would say that at the moment there is not a lot of financial sense in investing in the unabated bioenergy generation that you have because you do not have a vision of what happens post 2027.

Eddie Wilkinson: I have a vision. It is not one that is being shared or put into legislation.

Vicky Ford: You do not have a Government vision on post 2027.

Eddie Wilkinson: Yes. We are discussing with Government Departments, but at the moment it is being batted between DESNZ and DEFRA. At the end of the day, the litter will be in the—

Q296 **Vicky Ford:** Can I get back on to the CCS elements of this? How financially viable or economically sustainable are the different models we have had for bioenergy with CCS?

Philipp Lukas: From an anaerobic digestion point of view, there is about 1 million tonnes of carbon dioxide currently produced in the industry, almost all of which, over 90%, is relatively pure. It could be collected relatively easily. The opportunity is to make considerably more than that. Two or three years from now, if we had a sequestration facility in the UK, if we had somewhere to take it, that could be collected and sequestered.



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I believe that it is possible, on the basis of voluntary market demand for high-quality carbon removals, to be done commercially, possibly even without subsidy, albeit a kick-start would not hurt.

Q297 **Vicky Ford:** You have such confidence that this could work that you have signed an MOU with Northern Lights in Norway.

Philipp Lukas: Correct.

Q298 **Vicky Ford:** I have been to see that and it is not yet up and running, but you think—

Philipp Lukas: No. That is also delayed, so it is now a neck-and-neck race between UK facilities—potentially HyNet and Teesside—and Norway. There will be facilities in the North Sea but it is very difficult to tell whether it is 2027, 2028 or 2029.

Q299 **Vicky Ford:** By 2035, how will the cost to consumers of electricity from bioenergy CCS compare with wind and solar?

Angela Hepworth: It is hard to do that exact comparison because you are getting carbon removals as well as renewable power. The question is how it compares with other ways of decarbonising.

Q300 **Vicky Ford:** I will put it to Philipp. It is difficult for you to do it for Drax. How do you think your bioenergy CCS compares to wind or solar?

Chair: As briefly as you can, Philipp. Thank you.

Philipp Lukas: Yes. In another decade I think that biogas will stand unsubsidised because people will be willing to pay more for clean heat than they do today, partly because of the UKTs and other mechanisms like that.

Angela Hepworth: I would like to say that the cost of BECCS is the cheapest way to achieve net zero. Again, Baringa did some analysis for us that said, compared with other pathways to get to net zero, it would save the UK over £10 billion.

Q301 **Chair:** How close are we in the UK to building a full-scale BECCS plant? Maybe Philipp is the one for this, I do not know.

Philipp Lukas: We have two projects in phase one. At the moment, they are both expecting to go to final investment decision next year—July, September, take your pick. There are a few other political headwinds that might occur in 2024, as members might be aware, that could impact that. That is certainly the plan at the moment. Both schemes say that they could be ready to sequester CO₂ in 2027. HyNet has a lower infrastructure requirement because it has a lot of the offshore facilities but Teesside requires a lot of the offshore facilities to be built. Certainly, it is technically feasible to do it if we make the decisions to do it.

Q302 **Chair:** A slight question is required. How much energy do you require to capture a tonne of carbon?



Philipp Lukas: The production process for anaerobic digestion makes a methane molecule and a carbon dioxide molecule and we then split them through a sieve before we inject the methane in the grid, so the high-concentrate CO₂ is actually already there. We have a low energy requirement for liquefaction. We estimate that if you were to offset the residual inputs—if you take 100 tonnes of CO₂ for sequestration, 5% to 6% of that would be required to offset the residual aggregation, liquefaction, transport to facility and so on. Therefore, 95% of your biogenic CO₂ is then sequestered beneath the North Sea.

Q303 **Chair:** You are not needing an extra CfD for that then, because it sounds quite cheap.

Philipp Lukas: The total cost of doing all that is in the hundreds of pounds. We will either need to sell certificates in the region of £300 to £500 a tonne, which is very high, or we will need to get some support. Over time, I expect those costs to fall. The transport and storage costs for offshore facilities will fall with volume. It is very different whether a facility is sequestering 1 million tonnes or 10 million tonnes. The marginal tonne of CO₂ through HyNet, Teesside or whatever is considerably cheaper than the first tonne, having built all that infrastructure.

Q304 **Chair:** When it comes to Drax, if Drax is running BECCS, I understand you could do power generation or CO₂ power of maximum capture, but you cannot do both. What is the compromise and what extra CfD are you looking for? You are currently £139 per megawatt hour, I understand. What would you look for then?

Angela Hepworth: On your first question about power generation and carbon capture and storage, the carbon capture process requires some energy input. At the moment, each unit generates something like 650 MW. To capture the carbon from that unit will take about 200 MW.

Q305 **Chair:** Would a third of the power production of your unit have to go into carbon capture?

Angela Hepworth: Yes, but that is more efficient than the alternatives, such as direct air capture.

Q306 **Chair:** You have your CfD for all the 600 MW, and you are taking 200 MW to capture the carbon. Would you need a further CfD on top of that or would the CfD of £139 that you already have to produce the 200 MW do?

Angela Hepworth: The Government suggested that they will put in place a CfD for power and a CfD for carbon. That would need to cover the total cost of the project, but then it depends on how you allocate the cost between the power and the carbon.

Q307 **Chair:** Are there any particular technical obstacles that you have come across? I know there have been delays, so a bit further on that.

Angela Hepworth: No. From a technology and a project-readiness standpoint, we are doing extremely well. We have the existing biomass



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power station operating. Carbon capture and storage is a well-proven technology. We also had two pilot plants at the project running, which have proved that we can capture the CO₂ from the biomass flue gas. All the elements of the chain have been proven. It is just a matter of getting the green light to put them together.

Q308 **Chair:** It will cost £31 billion over 25 years. Does that ring a bell?

Angela Hepworth: We have not got as far as working out what the cost would be because we need more details of the business model before we can do that. We are at an early stage in our discussions about that with Government.

Chair: Independent energy analyst Ember has a figure of £31.7 billion for the 25 years.

Angela Hepworth: I do not recognise those numbers. We are still in discussion with Government about the business model so it is too early to say what the costs of the project will be.

Chair: Vicky Ford, do you want to come in briefly on this point or are you happy?

Vicky Ford: I have had lots of questions.

Richard Coulson: Can I please add, Chair, that we actually have members who are seriously looking to invest in the technology today? We have Evero, a 22 MW biomass plant in Ince Marshes. It has selected the technology for BECCS and will start the planning process next year.

Q309 **Chair:** Is that big enough for 22 MW?

Richard Coulson: It will cover the scale of that. It should be operational for the end of the decade. We also have the likes of MVV.

Q310 **Chair:** Would you also say a third of your energy might need to be taken to run?

Richard Coulson: I am not sure of the exact figures, sorry, but we could certainly try to come back to you on that.

Q311 **Chair:** How is the carbon going?

Richard Coulson: Evero is situated next to HyNet. It should be in track one. MVV in Ridham, Kent, is trying to work with local industries to form a group to make the transportation of the gas commercially viable. We have not talked about BECCUS. There are projects such as Chinook Sciences out in Nottingham who have working technology to take hydrogen from biomasses. That plant works in America today. They have a pilot plant in the UK.

I think that the important point to make, though, and our members are exactly the same as the gentleman at the end, we do not know what the future is. Some of our members will drop out with the subsidy regime



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from 2027. We need some transitional support now and we need the future greenhouse gas removal models to be flexible and inclusive.

The size of our plant makes it attractive to test an emerging technology, to improve it, and to build a UK contractor set with UK skills. You could use our fleet to fine tune and make the most of this technology. Let us move from BECCS to BECCUS. Let us get the full advantage out of it.

Q312 Mark Garnier: Angela, you will be pleased to hear you are off the hook for the next two questions if that is all right. Everybody else, you are not. I will turn to biomass energy using waste feedstocks. Will this be a significant part of our future energy mix? Do we have enough waste feedstock for biomass energy?

Eddie Wilkinson: We certainly have enough biomass feedstock for the current 2.8 GW that we produce and we have enough for my portfolio, which is about 111 MW in total. I would not advocate creating waste just to create a biomass power station, but I think that in the long term chickens will do what they do, people will eat chicken, so I think that process and the other fuel we use a lot of is straw—

Q313 Mark Garnier: These are chicken droppings, yes?

Eddie Wilkinson: Yes, chicken droppings in bedding. We also burn a lot of straw. Straw is produced as part of the wheat production process annually—you take the wheat and we take the straw with a revenue stream for farmers as well. There is no reason why that process, production, output and electricity generation should not continue into the future, apart from the lack of support, whether it is economic or not from that perspective.

I should also point out another factor. We produce 70,000 tonnes of fertiliser per annum. Early on in the discussion Philipp mentioned that we are reducing imports of fertiliser by producing a PNK-rich natural fertiliser from the ashes from the poultry litter.

Philipp Lukas: For the anaerobic digestion industry, there are certain things where we will not see big increases or opportunities. Sewage sludge will not suddenly increase or decrease. In the food waste space, we are already processing 5 million to 6 million tonnes, and that is the DEFRA target for overall food waste at the end of this decade. In animal manures, there is a lot of animal manure out there but there are two things to bear in mind. First, we probably need to reduce livestock holdings overall in the UK between now and 2050. Secondly, a lot of the livestock in the UK is outside, so you do not really have the opportunity to—you cannot put nappies on cows, if you like.

Mark Garnier: You could try.

Philipp Lukas: I would rather you than me.

Mark Garnier: I will leave it to you.



Chair: You have volunteered it first.

Philipp Lukas: Okay. We see the big opportunity in sustainable rotation that helps improve food crops, reduce fertiliser inputs, build soil carbon, and helps to build the resilience of UK farming to the effects of climate change.

Mark Garnier: That is a good point. Animal waste on fields does fertilise.

Philipp Lukas: Of course. It does, yes.

Q314 **Mark Garnier:** Okay. To a certain extent, you are in competition with—

Eddie Wilkinson: In the right proportions.

Philipp Lukas: Yes. Eddie would rightly argue that animal manures from chicken and poultry are very concentrated, whereas cattle are out on the field in the west country. That is where the issue arises. You have these very concentrated locations of manure arisings, particularly in poultry.

Q315 **Mark Garnier:** What do waste feedstocks look like? What is that comprised of? This is to both of you.

Philipp Lukas: In the anaerobic digestion industry, it is source collected food waste—banana peels, catering waste, all that stuff.

Q316 **Mark Garnier:** Is it the stuff you put in a compost heap?

Philipp Lukas: Yes, exactly. There is an element of green waste that comes into that. In Scotland and Wales, we have effectively 100% collection of food waste. In the UK we are hoping to get there in 2026 or something, but at the moment we have about 45% collection. You may have it at home; I do, some people do not. In sewage, it comes out as sewage sludges. The bulk of animal manures is very thin slurries—the urine and faeces of cows, pigs and so on—which does not have a huge energy content, is a lot of water to transport around and, as I say, often arises out in the field. In certain operations, such as housed pigs and housed poultry, you have very concentrated dry matter—very high-energy wastes comes out of straw bedding for broilers, for instance, which is what Eddie looks after.

Q317 **Mark Garnier:** There are different challenges in how you ship it around?

Philipp Lukas: Absolutely.

Q318 **Mark Garnier:** What is the best? What has the least challenges?

Philipp Lukas: The best thing to do is to put all organic waste that you can collect back to land after they have been through an anaerobic digestion or a combustion process.

Mark Garnier: Collecting and transporting—

Philipp Lukas: That is the thing. With wet wastes, such as slurries, it is quite complicated. With very dry wastes, such as chicken manures and



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food waste, it is much less so because they arise in places where you can collect them, conurbations particularly.

Eddie Wilkinson: I am not sure my operators would suggest we have dry arisings. They are always complaining it is too wet, to be fair.

Philipp Lukas: It is dry in slurries.

Eddie Wilkinson: It is dry in slurries—it is about 35% to 45%. Our feedstocks are, as I say, animal arisings, poultry litter, horse bedding, and straw and meatball meal from the rendering industry. It is reasonably unpalatable stuff to discuss around the dinner table, but that is what we deal with.

Philipp Lukas: Six million hectares of the UK is farmed, arable land that needs profitable rotational options with a whole raft of new soil health regulations coming through from DEFRA—which has a completely changing subsidy regime—all of which means that we need new opportunities for farmers.

Eddie Wilkinson: I would like to reiterate that this stuff will arise in the UK whether we are here or not, and it needs managing. That is my plea and my ask here.

Q319 **Mark Garnier:** Do you use slaughterhouse waste?

Eddie Wilkinson: The animal will go to a rendering facility and we take the renderings, the meatball meal, so effectively, yes, but it goes through a process first.

Richard Coulson: To clarify, not all waste can be spread to land. Post-consumer waste wood and certain cartons have environmental legislation to stop it. We are at near full capacity. We are proud that in the UK last year we either reused, recycled or recovered 95% of UK waste wood. The majority of it went to recovery. There is a 200,000 tonne gap. We talked about imports and exports. There is a debate to be had there now. Our country exported 150,000 tonnes of wood waste resource last year, I think. Should we keep that on our own shores now?

Q320 **Mark Garnier:** This is a slightly different question. Given the fact that we have all this waste—and it is good that we are using it—should we prioritise the use of this waste for the more difficult to decarbonise activities rather than the relatively easy ones? I am not a scientist, but if it is easy to take chicken guano and turn it into energy, it might be trickier but more useful to turn it into jet fuel for aviation, for example. Is that possible and should we prioritise it?

Eddie Wilkinson: I am not a scientist but having come across the varieties you get from winter to summer, I imagine that that would be a difficult process. Scientists might want to correct me. I am not sure.



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Philipp Lukas: Certainly, from an anaerobic digestion point of view. Because we produce biomethane that we inject into the grid, we contribute to decarbonising heat, which thus far has been considerably more difficult to decarbonise than electricity.

Richard Coulson: That is potentially BECCUS. We have talked a lot about BECCS. With what we have today, BECCS would be great but BECCUS is the true pinnacle. These use the size of our fleet to scale up the technology and make full use of biomass materials.

Q321 **Mark Garnier:** Should we grow more biomass?

Richard Coulson: Yes.

Q322 **Mark Garnier:** How does that work in competition with available land to grow food and raise not only crops but also cattle and livestock? At what point does the competition become complicated?

Richard Coulson: DEFRA has the target to move to 30,000 hectares of plant in a year. Confor launched a really stimulating report recently, using Forestry Commission work, that showed we have sufficient low-risk land in the UK to meet those targets. I think that I mentioned that we harvested 10 million tonnes last year from a plant of 30,000 hectares. There is considerable room for growth there. Some of that material can go through our mills to use more timber in construction, which will naturally produce more wood residues. When you sustainably manage and harvest a forest, there will be small roundwood and brushwood. We should make use of those resources.

Philipp Lukas: In arable farming, if you moved to a regenerative farming model there is an opportunity, particularly because we have seen over the last couple of years profitable opportunities fall away. Rapeseed in the east of England, in particular, is no longer as interesting as it was because the chemicals have fallen away, and we have flea beetle infestations and soil-borne nematodes around root vegetables and sugar beet, which are grown too close in the rotation. We need other profitable opportunities in the rotation so we can get back to high-yielding, high-quality food crops.

Q323 **Mark Garnier:** On the outputs, you produce biomass crops. How do they compare in price? Presumably, it is cheaper to produce it locally than to import that type of thing.

Philipp Lukas: From our point of view, because our feedstocks are generally quite wet, they are all local. You would not transport them very far.

Q324 **Mark Garnier:** Take wood pellets, for example. It is much easier to grow them locally than it is potentially to ship them in from Canada.

Richard Coulson: Is the volume there? Should we make more use of it? It is a balance. When you harvest a tree, there will be residues that you



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can use to make pellets out of the brush, the small roundwood and diseased timber, so that ticks two boxes.

Q325 **Mark Garnier:** What appetite is there among farmers to produce these crops?

Philipp Lukas: An ever-growing appetite. This year, particularly, farmers were paid £180 a tonne for their wheat, but they paid £600 a tonne for the fertiliser that came through last year. Given that subsidies are moving from what used to be £3 billion out of the CAP to about £1 billion out of Treasury, the economics of farming are challenged and any profitable rotational options available are interesting, particularly if they help on the decarbonisation path. That is the crucial thing. A lot of buyers—the big food companies and so on—are now starting to look into the carbon footprint of their supply chain, in particular, the farming supply chain. That is where opportunities to increase soil organic matter and soil carbon are crucial.

Q326 **Mark Garnier:** Looking at the market potential, then, if you have £600 per acre for energy crops and you have £150 per acre for food crops, presumably if everybody goes—

Philipp Lukas: No, that was the price you are paid for your wheat and the price you have paid for your fertiliser to make that wheat. That is out of context; I apologise. I am saying that you are paying a high price for your fertiliser but not getting a high price for your wheat in the global markets right now. It was the other way around last year. Farming is very volatile. To take some of that volatility out at the same time as making the transition to low-carbon farming, removing the diesel use, the fertiliser use and building up soil organic matter is what is interesting.

Q327 **Mark Garnier:** Yes, but I am talking about farmers starting to produce energy crops.

Philipp Lukas: The gross margin you get out of an energy crop such as ours is lower than you would get from a first wheat, and considerably lower than you would get this year from sugar beet. It is a break crop. It is not a main crop. It is not nearly as economically attractive as a good healthy blackgrass-free first wheat.

Q328 **Mark Garnier:** Okay, thank you. From the farmers' point of view, they will not all suddenly stop producing food.

Philipp Lukas: No.

Mark Garnier: Brilliant. That is it. Thank you very much.

Q329 **Vicky Ford:** I have a quick one. I think it is to you, Richard. I do not know if you have a view on this, but last winter when energy prices were so high, there was a trend of investing in a home wood burner for a lot of people. I have been told that it was very bad for air quality in urban areas. Do you have a view on that?



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Richard Coulson: That is a completely different sector from the WRA. That would be the Stove Industry Association. I think that the general principle is that as long as they are using properly seasoned timber in modern, well-maintained boilers, then no. There are places that are off the grid that need some sort of heat, so I still see there is a place for that.

Vicky Ford: Trying to make sure that wood is well seasoned is an important issue.

Richard Coulson: Yes. A quality fuel in a quality application. There is an industry that offers that. The Stove Industry Association would help you with those questions.

Chair: Thank you. We have reached the end of our session. Thank you all for coming. I hope that you enjoyed it, Richard, Angela, Philipp and Eddie. These are the questions that come up and it is our job to probe. I hope it was not too personally uncomfortable. Thank you again.