TRANSCRIPT_ISH1_SESSION1_DRAXPOWER_18012022

00:27
Okay, good morning, everybody. And welcome. Just before we begin, can I confirm that everybody can hear me clearly? Can I also confirm with Mr. Herold that the live streaming and recording of this event has commenced. Thank you. For those people who are watching on the live stream can I also just advise you that should we at any point adjourn, we will have to stop the live stream in order to give us clear recording files. And as a result at the point in which we commence and restart the live stream, you will need to refresh your browser page to review the restarted stream will remind you this if we do break. It is now 10 o'clock and it is time for this hearing. To begin. I would like to welcome you all to this issue specific hearing, which is issues specific hearing one on the scope of development in relation to the application made by Drax power limited, who we will refer to as the applicant for an order granting development consent for the Drax bioenergy with carbon capture and storage project. This hearing is for the application made by Drax power limited for so the applicant is seeking development consent to instal post combustion carbon capture technology on up to two of the existing 660 megawatt electrical biomass power generating units, which includes the modification upgrade and extension of existing operators at the Drax power station. My name is Caroline Jones, and I'm a chartered town planner. I'm a planning inspector employed by the planning Inspectorate and I have been appointed by the Secretary of State for levelling up housing and communities to be the lead member of the panel to examine this application. I'm not going to ask my father, a fellow panel member to introduce himself.

02:15
Good morning, my name is Ben Northover, I am a chartered architect and I have been appointed to be a member of the panel to examine this application.

02:24
So together we constitute the examining authority for this application. And we will be reporting to the Secretary of State for business energy and industrial strategy with a recommendation as to whether the development consent order shouldn't be made. The case manager for this project is George Harold, and he is supported here today by a tiller boss. We also have Lily Robins and Kaylin Atkins providing support remotely for us today. Please don't hesitate to contact a member of the team if you do need help at today's event or with any other technology. Today is a blended event and that comprises an in person meeting as well as being held on the Microsoft team's platform. It has been both live streamed and recorded. For those observing and participating through teams. In order to minimise background noise, can we just ask that you stay muted unless you are speaking today. If you are participating virtually and you do wish to speak at the relevant point, then please just use the hands up function. But please be patient because we might not get to you immediately. But we will invite you to speak at the appropriate time. Alternatively, please turn on your camera so that we can see you wish to speak. Just want to remind people that the chat function on Microsoft Teams will not work so please don't try to use

it or ask any questions or post comments in there. If you don't manage to ask your questions or raise your points at the relevant time, then there will be an opportunity at the end. So recordings that we make are retained and published. They do form a public record that can contain your personal information and to which the General Data Protection Regulation applies. The planning inspector its practice is to retain and publish recordings for a period of five years from the Secretary of State's decision. Consequently, if you participate in today's meeting, it is important that you understand that you will be live streamed and you will be recorded and that that digital recording is published. If you don't want your image to be recorded, you can switch off your camera. And for those of you in the room, if you don't want to be recorded and there is an area at the back of the room that is out of the camera shots. We will only ever ask for information to be placed on the public record that is important and relevant to the planning decision. Therefore, to avoid the need to edit the digital recordings, we would ask that you try your best not to add information to the public record that you would wish to be kept private or confidential. If you feel if you feel personal information is necessary, then please provide that in a written statement that we can redact before publication. Does anyone have any questions with regard to this matter? I'll move on then. We I'll just deal with a few preliminary matters for those who are attending here in person today? Can I just ask that everybody please that all their devices and mobile phones to Silent please, we're not aware of any fire alarm tests or drills today. So in the event of a fire, please exit by the doors at the back. There are toilets in the room which are located on my left here just behind the bar. We plan to take a short break at around 1130 If we appear to go beyond that time, if this happens, for those of you who are participating virtually you will need to ensure that your cameras and your microphones are turned off during the break. An audio recording of today's meeting will be available on the Drax bioenergy with carbon capture and storage section of the national infrastructure pages of the planning planning Inspectorate website as soon as practicable after this hearing. With this in mind, please ensure that you speak clearly into a microphone. If you're not at a table with a microphone, we do have a roving mic. So if you could wait for one of these before you speak, and just make sure that you state your name and who you represent. If you are a representative, that would be really helpful. If any individual or group wishes to use social media report, film or record during today's meeting or any subsequent hearing, then they are free to do so. But please do so responsibly and with proper consideration for the parties is must not be disruptive and the material must not be misused. This meeting is going to follow the agenda as set out in Annex F of our letter of the 13th of December 2022. And it would be helpful if you had a copy in front of in front of you. The agenda is the guidance only and we may add other considerations as we progress will conclude the hearing as soon as all relevant contributions have been made. And all questions asked and responded to. But if it's the case that this good discussions can't be concluded today, then it may be necessary for us to prioritise matters, and defer other matters to written questions. Likewise, if you cannot answer the questions today, after being asked or require time to get more information, then please can you just indicate that to us that you need to respond in writing? Thank you. I'm now going to hand over to Mr. North over to go through introductions.

07:13

Thank you, I'm now going to ask those of you who are participating in today's meeting to introduce yourselves. When I state your organization's name, please could you introduce yourself stating your name and who you represent? And please could you also state how you wish to be addressed? For the purposes of the recording, it will be enormously beneficial to us. If each time you speak throughout the

hearing, you could start by stating your name and who you're representing. I'm going to start with those people who are in the room with us. So if I could start with the applicant and any of their advisors, please.

07:51
Good morning, sir. My name is Richard Griffiths and I'm a partner at Pinsent, Masons LLP, legal advisors to the applicant, Drax power limited. I'm joined today with my colleagues to my right, Matthew Fox associated Pinsent Masons. And in the room is Alexis Coleman, senior associate at Pinsent Masons. Joining me on the table from the applicants and its advisors, is to the immediate right of Mr. Fox is Mr. James Pete, who's associate director in carbon at environmental consultancy W. SP. Next to Mr. Pete is Mr. Jim Doyle, who is the planning and consensus manager at the applicant. Next to next to Mr. Doyle is Mr. Matthew stalks, who's associate director in planning at W s. P. And then next to Mr. Stokes is Mr. Chris Summers, who is technical manager operations at the applicant. We also have other representatives of the applicant or their advisors recipe in the room who we may or probably most likely need to call upon, depending on where the agenda goes. I can introduce them now, or as and when we might need to call upon them.

09:10
If you could introduce them as in when we need to call on them. That would be that'd be helpful. Thank you.

09:15
How do you so thank you

09:22
can we then move on to the organisations who have expressed a wish to speak so? Selby District Council first place?

09:36
So Jenny Timon, Assistant Principal Planning Officer at Selby District Council.

09:44
Thank you. And North Yorkshire county council.

09:48
Good morning. Kenny Dawson, senior

09:50
solicitor of North Yorkshire county council. To my left is my colleague Michael Reynolds, who's the Senior Policy Officer for North Yorkshire county council.

10:04
Thank you. And do we have the environmental agency with us?

10:08
Good morning, sir. My name is Chris gone. I'm representing the Environment Agency and the regulatory officer for Drax power station. I was due to be accompanied today by a colleague from our sustainable places team. Unfortunately, she's on ill at the moment. So on the line, we do have a con from that team, and Matt Wilcock, who, if there's any questions around our representative representations and setting up Common Ground methodology, he might be able to assist me with those answers.

10:41
Thank you. And biofuel watch.

10:50
Yes, Casey bow for biofuel watch. And to my left and my colleague, Mary Dickinson, and tomorrow. Sorry.

11:04
Thank you, and Mr. Hewitt? Could you introduce yourself? Thank you,

11:08
James, yours, I'm independence. Special. My interests are in land use change and governance. I'm a shareholder in Drax and a number of my colleagues apart from the watch.

11:27
Okay, now, if I could just ask if there's anyone else in the room today who wishes to speak if they could let me know. And again, if you could introduce yourself. And if there is a particular agenda item that you would like to speak on? Let me know which one

11:48
I'm not seeing any hands. So now if I could move on to virtual attendees, again, if you could introduce yourself, and if there is a particular agenda item you wish to speak on. Please state that. Thank you. So starting with National Grid carbon limited, do we have someone? Good morning,

12:11
sir. Aksana Bryce here from BDB Pitmans. I'm a senior solicitor acting on behalf of National Grid carbon limited. And we will be if you have any questions in terms of interaction between the schemes, we're here to answer those questions and discuss many things.

12:33
Thank you. And do we have Mr. Jelena? Yeah,

12:40
yes, I'm here. I, I don't expect to ask any questions.

12:50

I'm just representing myself.

12:54
Okay, thank you. Is that Is there anyone else? Who's joined virtually who wishes to speak? This doesn't preclude you from speaking later if you wish to respond to comments made by any parties during the course of the hearing.

13:15
Are there any comments anyone wishes to make under agenda item one. So that concludes this item of the agenda. Thank you. I'll now hand back to Mrs. Jones.

13:31
Okay, I'll just move on to agenda item two, which is the purpose of the hearing today, the hearing will be a structured discussion which will be led by the examining authority. We are familiar with what you've already submitted to us. So you don't have to repeat it length, anything that you've already put to us in writing. Submissions carry equal weight, regardless of the format in which they are put to us. If you do refer to any documents this morning, it would be helpful if you could give us the correct examination Library Reference number. Please do try to avoid using any acronyms as people who might be watching in the room might not be as familiar with those terms as you are. This hearing on the scope of development is being held to ensure that the examining authority and interested parties can fully understand the applicants proposals, the examining authority consider that it is appropriate to have a hearing of this nature, given the relative newness of this of this emerging technology so that the project at any technical matters can be fully understood, identified and considered early. It isn't our intention today that This hearing will examine matters that have been that have arisen from individual representations. Their matters which will be the subject of consideration as the examination progresses, whether in writing or orally at further hearings as required following the submissions of written representations. However, if interested parties do want to raise any matters they are welcome to do so. In writing in their But in their written representations, does anybody have anything to raise on what I've just outlined? In that case, we'll move to Agenda Item three, which is components of the drugs project. Before we begin, you may find it useful. Before we start asking questions, I have a few documents to hand today, we would suggest the planning statement, which has examination, Library Reference, a PPO three, three, the needs and benefits. Sorry, that's the needs and benefit statement is a BB, oh three, three, version three of the explanatory memorandum, which is a PP. O seven, eight. Yes, Chapter three alternatives, which is a pp 039. Chapter Six air quality, which is a pp 042. And es chapter 15, greenhouse gases, which is a pp 051. As indicated in the agenda, the examining authority would find it helpful if the applicant could provide us with a brief explanation of the carbon capture planned, including the post combustion technology and the processes involved. And I believe you do have a PowerPoint that you're going to share with us this morning. So if I could just ask you to begin with that.

16:24
Yes, thank you, but originally was on behalf of the applicant? Yes, Mr. Jim Doyle. We'll start off with a brief explanation of the components of the power station with a slide presentation. And the intention is he'll invite questions after every few slides. And then the second part of your gender item refers to

compliance with the NPS is so after presentation and you've asked questions on that, I'm happy to deal with a brief explanation of of that element of your first bullet point. So however, now to Mr. Doyle.

16:58
Thank you. Thanks very much. So I'll run through a brief overview of the process, the technologies involved, and then context within the existing power station site if that's okay.

17:10
Mr. Doe, could you just move slightly closer to your microphone? Thank you.

17:18
Okay, so the first slide shows an overview of the process components.

17:32
But what you can see there and you can see my my cursor on the on the screen, on the bottom left hand corner, there's my cursor there. That's what we call the quench column. That's a flue gas cooler process, which cools the flue gas down before it enters the absorber column. The reason why the flue gas has to be cooled down is that the solvent that operates within the absorber column needs to operate at a specific temperature in order to optimise the capture of the carbon dioxide. So the flue gas cooler the quench column as we call it, cools down the flue gas prior to entering the absorber column. If I then move on to the absorber column, that's the the tallest or the largest structure there. You absorb a column is where the solvent interfaces with the carbon dioxide from the flue gas chemically binds to it, trapping it and removing it from the from the flue gas. The flue gas with carbon dioxide removed is then directed back to the main stack tracks and then emitted to atmosphere. The solvent with the carbon dioxide now trapped within it is then moved through the system through a series of ducts to regenerate a column. The regenerator then splits the carbon dioxide from the solvent. The solvent can then be captured and reused back into the system. So redirected back to the absorber column. The carbon dioxide is then directed out of the regenerator, again, through ducting, through pipe work to a compressor system before it enters the transport and storage network, and then off to storage into the North Sea. Okay, and I'll just stop there just to check if there are any questions about the basic process of carbon post combustion capture? No, okay, I'll move on.

19:51
I think we have good questions that we do want to ask that might, you know, do ask us and we'll we'll pipe up if we do have anything but we will have some at the end,

19:59
as well. Okay, no problem. Thank you. Okay, the next slide shows an existing post combustion capture system. This isn't the Drax plant, this is a different a different plant, but you can see the main components there in a single a single slide. So, you have the flue gas cooler system, the quench column, as I described it, you have the taller absorber column there in the centre of the of the photograph, and then you have the regenerator column next to it. And then you have a solvent storage area where the solvent is is stored in in these small, small columns. You can see flue gas ducting here down at the bottom. And then behind the absorber, you have a carbon dioxide compressor unit which

compresses the carbon dioxide prior to transport. So, this is the Drax power station as it is today. tracks is largely oriented oriented north to south. I'll just run through the main components of the drag site just for context so people know what we're looking at. So, those are the southern cooling towers there are six hyperbolic cooling towers at the south end of the site. They serve units one, two and three. We then have the northern bank of cooling towers again six hyperbolic cooling towers, they serve units four, five and six. In the centre, we have the main stack that's 259 metres tall. Behind next to the the main stack there, that's the flue gas desulfurization plant. The carbon the main carbon capture plant will sit on the footprint of the flue gas desulfurization plant serves units five and six currently. There we can see the combustion units, one to six, one at the southern end of the site, six at the northern end of the site. And then just in front of the combustion units is the turbine house. And then at the bottom of the screen, that's the national grid 400 kilovolt substation. So that's the plant Drax power station as it is currently today. This is the red line boundary that's been proposed. So almost the entire curtilage of the Drax power station site, obviously is owned by Drax, just where my cursor is just to the right of my cursor, there's a field which also is owned by Drax that will be used as a lay down area.

23:00

And this is the work plan overview for the power station site. So the various work packages that encompass the proposed scheme. And now I'll just run through where those specific elements that we've that I've just described sit within the existing power station site. So work number one D, the carbon capture plant that is largely the quench column, and the absorber sits within the purple hatched area there, you can see that it sits on the footprint of the flue gas desulfurization plant, and just to the south and west of the northern bank of cooling towers. So we have the quenched column, the smaller column, they're identified in the in the red box. And then just next to it, we have the absorber column. And you can see any sort of inset diagram where they sit in context with the main stack, and I've just identified the where the flue gas ducting would go so come out of the combustion plant, and then into the quench column around the quench column. And then enter the absorber column at the bottom of the absorber column. You then have a counter current flow of the solvent coming down the column trapping the carbon dioxide prior to entering the regenerator columns

24:41

Okay, the next work package I like to describe work number one d i n one D IV, solvent regeneration for units one and two. You can see again that sits largely around the footprint of the flue gas diesel Fraser desulfurization plant and just off to the south and west of the Northern cooling towers. And this is what the soul regeneration plant would look like. So you have two columns serving a single unit. So that's, that's the quench column during the absorber and a two regeneration column serving a single unit. And that would be the Indicative layout for two units. So you have to quench columns, to absorber columns, and then for regeneration columns. And again, you can see the inset diagram where they would sit next to the main stack at Drax will also have a common solvent storage and make up system. So as the solvent is recovered, some of it will be spent and will have to be made up that's work number one d v i, that sits just to the west of the Northern cooling towers. And that's where the solvent storage column would be. And that's what they would ideally look like. Again, the inset shows where they would be in relation to the regeneration columns. And then we move on to carbon dioxide processing plant for units one and two. So that's work number one EI and work number one EI. So these are the compression facilities. So the brown sort of boxes there that you can see, that would be the compression plant, prior

to it being compressed, and then transported off site. Again, you can see in the inset diagram where the compression plant sits within the rest of the site. And then finally, work number one network number two, the carbon dioxide transport infrastructure is these brown hatched area, which is in what we call the existing wood yard at Drax power station. So this would be an above ground installation that would then connect into the national grid infrastructure for transport and storage. And in the inset diagram, I've taken a snap from National Grid PIR documentation, which shows a number of options that they've identified, which is just off site from Drax power station, options A, B, C, and D, which will be options for their above ground installation, you can see that their red line boundary interfaces with the red line boundary around the area that I've just described the woods yard area, which is hatched in brown.

27:42
So this is an indicative aerial view of the power station, and where the carbon capture and storage plant would sit. So you can see the various components of the Drax, compat Drax, power station site, so the cooling towers, the combustion unit, and then you can see the carbon capture plant that sits just to the north of the main stack. And

28:09
that's that's it. That's

28:09
a very quick overview of the carbon capture

28:11
plant.

28:22
Thank you, Mr. Dial. And before before, I've got some questions that I would like to ask about some of the components myself. Does anybody else in the room have any any comments they wish to make? Following that presentation? Nice to hear it.

28:42
James Hewitt, I mentioned the chimney the main stack. The carbon dioxide is going to go through the absorbers. And then as you've mentioned, other emissions will go back up the stack, will there be an interruption in the flow? Will the flow be the same velocity and the same temperature for dispersion over Selby? Everywhere else? Thank you.

29:05
So the there will

29:08
be Mr. Dial Can I just just remind you every time we speak just for the recording as if you could just say your name and who you represent. Thank you, Jim doll

29:15

Drax power apologies. So the the quench column does call the flue gas down. But then we have a series of heat exchangers to put heat back into the flue gas. So in the air quality chapter we've identified the the emissions velocities and the temperature of the gas the back scheme will slightly change the dispersion. As I say the air quality chapter does identify what we have modelled so that the temperature changes but it's a it's a fairly subtle change in the temperature of the flue gas being being emitted.

30:03
Okay, does anybody else have any anything they wish to raise? Okay, well the examining sorry Do you have a few questions just about components so we'll we'll go into them work number one A which is the water pretreatment plant the expansion memorandum states that this is necessary because the carbon capture plants require better quality water. What do you mean by better quality water?

30:36
I'm Jim Doyle tracks if I pass over to my engineering colleague Chris summers with us okay to answer that question.

30:45
Morning Christmas, Drax engineering, from a. So the capture process uses extracted river water through heat exchangers and coolers. So for that improved efficiencies through the coolers we're looking at making improvements to our abstraction from the river. So to clean up polish that water to sort of best description to it to get the best efficiency through the the installed coolers for the process.

31:21
Okay, thank you. Just before I move on, could I ask you to take down your the presentation? Yeah. Thank you

31:37
and in terms of that water pretreatment plant, can the can the carbon capture plant itself not operate without that work?

31:45
Chris summers Drax again from a capture plant would still operate but there's obviously efficiency improvements with improving the current abstraction. So

31:57
so the efficiency is in the ability to extract the carbon rather than the efficiency of the boilers themselves.

32:03
It's not directly related to boilers for this matter, the the catch process is a thermal process. So getting that heat interaction, efficiency is the key to a lot of stuffs. Okay.

32:19

Thank you. I think the expansion memorandum also states that this work will have the benefit of increasing the operational capacity and the duration of the existing power station. Can you explain in more detail what is meant by that

32:37
person was Drax again. So from a station perspective, so the existing running units, there are benefits to cleaning that water up. So it's other across benefit for the next process and the running units. So we use river water amongst a lot of processes on the current operating units. So any improvements with sediments and things that are in the water, we can do will increase heat transfer efficiencies across the existing site as well. So you're

33:12
talking about increased efficiencies, efficiencies more rather than increasing the sort of the output necessarily Yeah. Okay.

33:28
And again, if we could just move to work one B, which is the grading and extending the cooling water system, again, could you just explain why that's specifically required for the carbon capture plant

33:43
on chrysalis Drax again. So, from a the again, the process requires thermal interaction to split the carbon away from the solvent. So the intention is is to reutilize existing redundant infrastructure. So following the closure of two of our units, we're utilising existing installed infrastructure at the north end of sites such as the cooling towers, CW pumps, the pipes that supply all that systems are it's a benefit to the system that we are reusing reusing existing plant.

34:29
In similar question, again, if I can on work one C, which is the upgrade to the the boilers and turbines, could you explain why upgrading the existing boilers and turbines would result in greater efficiency? And again, what you mean by greater efficiency?

34:49
Warren Christmas Drax again, from a an overall plant efficiency Drax has over the years we continue to strive to do and carry out upgrades on the boiler and turbine. So we're getting the overall efficiency of the unit is greater. So we burn effectively less biomass for the same megawatt hour. So again, it's a constant improvement that will be ongoing, that we will carry out any upgrades to sort of keep that efficiency as high as possible.

35:27
So do all of these works are necessary for the carbon capture plant, then they're not there to prolong the life or increase the output of the existing power plant.

35:41

triggers and pathogenic. Yes, I mean, the without works, one, A and B, you you, you won't be able to operate the carbon capture plant, they're integral part and part of the carbon capture, we split them out because of easier in terms of the work packages and the works plans and interrelationship with the power station. But to ensure that we're not those works A and B on their own. Whilst they have worked their way up in when constructors on their own without doing work, see if that's where you're coming from, which I assume is the line of questioning. But we've we've highlighted in the explanation random, the indirect benefits, if you like have those works, which does have an efficiency benefit, which means that less biomass be burned to generate the same amount of electricity. And that's a knock on consequential benefits of all of applying the Beck's work one C, facility to the power station, it's worth adding that the generation outputs of each year of units one and two, which is currently approximately 660 megawatts, will remain 660 megawatts post backs being applied to the power station. The to that the generation output isn't being increased, as it was awful backs, the output stays at 660. Currently, what goes on to the grid per unit is approximately 645 megawatts, following internal power requirements, that also stays the same. What changes I know we've got some questionings on this later. But what it kind of links into your what you're asking me now, what changes though, is as you're plugging in, in simple language, a capture a carbon capture plants that itself requires power. And that then means that what eventually goes to the grid, it will be circa 450 to 480 megawatts. So the 660 stays, which is the current generation output, then, in some of the existing internal power requirements at the power station is 645. That stays the same. But then we're adding on a new component to the to the power station, the extension, which is which itself requires power. And that means what goes the grid is then 450 to 480 megawatts. So that's it. Hopefully, that's helpful. Explanation of the generation output isn't being increased by Beck's. But there are indirect benefits of applying this equipment in addition to the carbon capture element as well. That's great.

38:15
Yeah, that's helpful. And we will come back to the output issues a little bit later. And if I could just ask, you have four, four biomass units. Am I correct? Yep. But the decision has been to instal the carbon capture on one or two, could you just explain the rationale behind only only building on one or two of the units as opposed to all four

38:47
are passed to Mr. Jim Doyle, drugs

38:52
okay. So the infrastructure we have at the moment on site, obviously, unit five and six, which are our coal units at Drax power station, will, will be will be closing in order to run to Beck's units. The cooling water infrastructure, as it stands at the moment is is only capable of cooling down to up to 2x units.

39:33
There's more than just space on the sides. Is that the ability to what

39:38
your question was? Why haven't we applied for for vaccine it's the patients currently for two vaccine. It's the I mean coming into commercials here. The as you'll be aware in policy, there is a business model

being consulted on for a by government for backs and the application for you is for two units based on the applicant's conversations with governments and the mod on the commercial modelling business model that they're consulting on considering for Beck's. And at this point, it is considered that to Beck's units are the likely scenario to be assisted in funding from the who backs model for HM Treasury, we go into that in more detail at the relevant point the agenda, there is a possibility that you could have a third BEX facility on the site in the future subject to hm, Treasury, etc. That is not before you, that will be a decision further down the line that could be accommodated on the site.

40:54
Okay, that's helpful. Thank you.

41:07
Just Just on that point, so you mentioned that units five and six closing down enable the the existing cooling process with those to be applied to this additional unit. So there's the space on site for a potential third x unit, which I know is not part of this application, but that would require further cooling infrastructure as well.

41:31
It's not correct. Jim Doyle, Drax power yet so. So if we were to fit an extra another Beck's unit, we will be looking at additional coding infrastructure.

41:42
Thank you. Okay, that's all the questions that I have on this matter. Does anybody have any matters that they wish to raise? Following what they've just heard? Yes, I can see at the back. Mr. Harold, could you take the mic? Thank you. If you could just if you could just say your name. And if you do represent any organisation, just let us know, please.

42:15
Sorry, Robin, just representing myself as interesting. I was just wondering what temperatures the flue gases are coming out at normally, and what temperatures it has to be cooled down to and then what temperature it has to go back up to, which will give you an idea of the amount of energy required. And thank

42:31
thank you. To the applicants wish to respond to that.

42:38
I think the technical team is just confirming no problem is up. Give us a few minutes for a few seconds.

42:48
Jim Doyle, Drax power, so I mean, the detail in terms of the temperatures that the flue gas is emitted out is in the air quality chapter. I don't know the details popped in my head, but we can certainly find out and presented to you later if that's okay.

43:07
Yeah, I mean, we are coming back to sort of similar topics later on, if that's something that you could sort of be looking at for now. And then you can come come back to perhaps answer that question for for the lady later.

43:18
We can't have air quality expressed he wasn't on the agenda. We also have air quality teams. We do have an air quality, one of our air quality experts with us today. We thought we might delve into that. But we can certainly take that away and provide an answer.

43:33
We might find an appropriate point later on today.

43:35
Or in writing, if necessary. Thank you.

43:41
Anyone else? I guess Miss Brown.

43:45
Casey Brown for biofuel watch. Yeah. I just wondered in terms of the expected efficiency gains, tracks able to quantify what those might be. Thanks.

43:59
Are you talking in terms of the existing the existing efficiency gains from the existing power plant?

44:05
Yeah. Yeah. In terms of the kind of hope for improvements. So what's just been discussed?

44:14
Does anybody from the applicants team wish to

44:17
so as you can see, technical team, we're just discussing, Mr. Luke Foley has just joined the table. He's head of engineering, and he's wild. Have an answer shortly on that. Hopefully

44:41
while

44:41
Chris summers drags again, when we started talking about the efficiency, the efficiency benefits across the site. It's more efficiency around the the heat transfer through the coolers. So the improvements to reducing sill in the system. We get a better heat transfer through the coolers, this maintenance regime on the coolers will be less. We also met with pumping less so around the system, our large CW pumps

run more efficiently. From the numbers perspective, it's sort of difficult to sort of pinpoint an exact improvement number, but it's all about the so that I mentioned earlier, the capture process is very thermal orientated. So whether you will ever we heat and we want to cool down so the more efficiency we can get how that cooling process is better.

45:40
If I just finished that risk was on Paul Hopkins, I think it's worth highlighting that we're not relying on those indirect benefits as the benefit of the scheme in the planning balance. That is for us the carbon capture, they refer to an expansion memorandum just to explain what each of those work one A and one B, what role they play, in addition to their requirements for the carbon capture plants, they also have a knock on a benefit in terms of the wider operation of the generating station given their interrelationship. So I think it's worth highlighting that we're not saying any particular weights should be placed on those indirect benefits, but for the sake of completeness, that the explanatory memorandum just wants to go into that detail of how they also had those indirect benefits to the existing operation of the facility.

46:28
Thank you, Mr. Griffith. Anyone else have any further comments? Okay, in which case, we will move on. As indicated in the agenda, there are a number of areas that we would like to explore the majority of our questions today all aimed at the applicant. However, if at any point anybody does wish to speak on these matters, please just do let us know whether in the room or virtually, by using the raise hands function on Microsoft Teams, and we will come to you at an appropriate time. Our first questions are around the overall change in greenhouse gas emissions from the power station. The application states that if approved, Drax would be the first negative emissions power plant in the UK. Could the applicant give us a brief run through of the figures used in the greenhouse gas emissions calculations, the source of them where they come from if we could just have sort of a step by step explanation of how those figures have been used? And the end outcome, please?

47:37
Yes, ma'am. I'm gonna pass it over to Mr. James Pete, who I introduced earlier, is the Associate Director of double SP and he's the author of chapter 15 and appendix 15.1. And appendix 15.2 of the environmental statements talk you through those precise, precise figures.

47:57
James P W SP. So in terms of the baseline, there's no construction on site. So construction emissions are zero in the baseline. We then reporting 547,915 tonnes of co2 per year from operations. So that's two units running at mid merit. That includes operational energy use, land use change at the site. So that's areas which are currently vegetated, now sequestering carbon now. So the loss of those will be the net balance when we get to that and emissions from the biomass supply chain. And they're based on an assessment that has been third party verified by Bureau Veritas. So over the whole life, so construction and operations under the baseline scenario, that's 25 years. We're looking at 13,697,875 tonnes of co2 with the scheme construction emissions are 104,700 tonnes of co2 that's based on the production of raw materials, that transport to site, plant activity on site and the removal of waste. The information comes from the most recent design information from the design team and a bill of quantities

for that. That's then combined with the inventory of carbon energy from Bath University which is emissions factors. So the rate of carbon associated with materials as well as some information Shouldn't from Rick's Royal Institute of Chartered Surveyors and that information has allowed us to establish the emissions associated with transport and plant use a head of head of the project operational emissions minus 7,975,620 tonnes of co2 e per year. So that includes emissions from the biomass supply chain in the same using the same methods is within the baseline. The co2 captured by the carbon capture process we've just heard about replacement and refurbishment emissions. Again, operational energy use emissions from the production of the solvent used during operation. And the other side of those land use change at Site emissions. And that's based on the two units running at full capacity. So that gives us the whole for the whole life construction and operation emissions for the 25 year design life of 199,302,775 tonnes of co2. So then on a net basis, because principally because of the biomass supply chain emissions under the baseline scenario, compared to the negative emissions due to the capture, we come to a position of minus 213,000,650 tonnes of co2.

52:06
Okay, thank you. And in terms of using calculating the carbon using the biomass supply chain, is that a figure for the whole plant or just in relation to units one and two?

52:21
James pizza recipe, it's just related to units one and two in the baseline under the mid merit scenario, and then in the with scheme at full capacity for those units.

52:36
Okay, so the supply chain includes everything from start to getting to getting the pellets to Drax, how have you worked out how much of that is just for units one and two.

52:50
So the information from the assessment done by blue Rivera task is on the basis of at each of those stages. So from processing the origin for feedstock, transport, etc, for each of those stages, the number is a quantity of co2 per megawatt of energy. Okay, and so because we know for units one and two the megawatts of energy, we then know the proportion of biomass that's associated with unit one or two, and then we can apply the figures for each part of the supply chain from the work done for that assessment to just those Okay, so it's a it's an input, it's important

53:29
that you and then in terms of we're talking about negative emission is here. So when you're sort of in here, negative emissions, are you talking about the whole power plant? Or are you talking about just units one and two,

53:43
just units one and two. So just the proposed development.

53:46

I think it's important to emphasise that units three and four aren't in this application, they are running, and they will continue to run. They're currently running under subsidy regime that comes to an end of 2027. We've then made an assessment as to how they are likely to run post 2027, which is the mid merits scenario and that so unit three and four will carry on in that will run in some form. And we've assumed that that term, 4000 hour per unit scenario, this application is not covering those two units. This application is obviously covering only unit one, nothing is changing in planning terms in respective three and four and how they're going to be operating, that they will carry on regardless of whether or not Beck's gets consent.

54:38
Yeah, I understand that. I think what I'm trying to understand is that is the claim that it's going to be the UK is first negative emissions. Power Plant referring to the power plant as a whole as a result of just the works for Unit One and two, or are you is everything that you're putting to is purely related units one and two, and you're only asking us to consider the impacts from one end to

55:06
the statement or in respect of the proposed development, which is unit one and two, so they will be carbon negative. Okay,

55:13
so I think the planning statement has actually actually say this will be the UK is first negative emissions power plant. To me if you're using power plant, you mean, the whole power plant?

55:35
But I think

55:36
Michael Goldsworthy from the carbon manager at Drax worth him just to make comments on that point.

55:49
Over here, Michael Goldsworthy from Drax the negative emissions delivered through units one and two will be far in excess of any other emissions that are there on plants. So that statement will refer to both one and two and the entire powerful. Okay.

56:07
Thank you for that.

56:19
And the calculations for the carbon capture in that table is that is that for both units one and two added together or if only one is installed is that the same amount of, of carbon luck.

56:33
All of the calculations were done on the basis of both units. Yes.

56:37
matter if it's helpful, we will check it in the material. But it's just to go back to that point about the carbon negative statement. If it's not in the application, what we can do is show why we justify that stem terms of the carbon negative from the post development and then show what the emissions from are assumed to be on unit three and four, and then demonstrate how because of the extent of that negative carbon negative emissions, you still get to a negative position on the power plant as a whole. So that's helpful. We can check it's not in the application. At the moment. If it's not, we can put that paper very quickly to go.

57:12
Yeah, I think that would be helpful. Actually, if we could if we could ask for that by deadline one.

57:17
I don't see why we can't do that, too. Yes. Thank you.

57:27
Think what I would, wouldn't mind if you could share with us. The combustion of biomass as cheetahs is carbon neutral. In these calculations, could you just give us an explanation for the benefit of everyone as to why it's treated as carbon neutral?

57:43
I'll just start off first, and I'll hand over to Mr. Pete, I think it's I think, not the carbon neutral phrase where we've we've included the biomass supply chain in our calculations, it's zero rated. And the calculation, that's the key elements. So in the combustion of biomass, a rating of zero has been applied. In the GHG assessments, you have the quantity of carbon emitted in appendices. 15.1 or 15.2 respects the baseline and with post development, so you can see the tonnage on the burning biomass in terms of then the calculation, that figure has been applied to zero. We've included the biomass supply chain, as Mr. Peters explained. So we're not saying in essence carbon neutral, because that would then mean that we don't include the the biomass supply chain we have includes the biomass supply chain, from cradle to grave. In terms of the reasoning why the Zero Rating, I will then pass it over to Mr. Peter to explain that point. Thank you,

58:43
James, P, Ws p. So against all of the guidance out there, biomass is rated as zero, although it's recommended that omissions are presented as out of scope of information only purposes as we've done. But of course, you need to determine significance against what's in scope. So those key pieces of guidance are the IPC 60,006. National reporting guidelines and in particular, chapter two stationary combustion, the GHG Protocol standard, again, on page 63 of that, and then the UK environmental reporting guidelines, page 62 of that one. And I think it's, it then follows through into policy. So, for example, in the climate change committee's balance pathway to net zero is published in the most recent set of carbon budget, Beck's is introduced and used as part of that trajectory as negative emissions. Likewise with the UK, industrial, decarbonisation strategy, etc. And the scientific rationale So as to why that happens is that the co2 emissions from biomass are considered short cycle. So unlike like fossil sources, so the the biomass grows, removing carbon from the atmosphere, then

combusted. If it's released to the atmosphere, it is then recaptured by the regrowth of said, biomass in a in a cycle over a period. And so there is no net change in co2 in the atmosphere due to combustion of the biomass. Is that the rationale behind those pieces of guidance?

1:00:41
Thank you, Mr. P, then you did mention a few. I'm not going to ask for full documents here. But you did mention a few chapters or sections of relevant reports or documents that lead you to come to the conclusion that you know that that figures should be zero. Would it be possible to submit them into the examination?

1:01:04
Again, I can't see why not.

1:01:05
I think if we could ask for that by deadline one as well, please. Yes, I

1:01:09
confirm that is so because the 2019 refinements to the 2006 IPCC guidelines for national greenhouse gas inventories, and it's in Volume Two, paragraph 2.3. Point 3.4. And we'll submit that thank you volume into the examination. Yep, just just the extract.

1:01:34
Okay, I'm gonna move on. The government's biomass policy statement states that the government is clear that that any Beck's deployment must be genuinely incredibly net negative, meaning that it must remove more greenhouse gas emissions from the atmosphere that they create and store them in long term geological storage. But that also states that the assessment that would then include all greenhouse gases from the whole supply chain, and that's including the carbon plant and the eventual store, from what I understand the eventual store hasn't been included in those calculations in chapter 15. Can you explain why they haven't given that the biomass policy statement states that they shouldn't be? And if they haven't, why have Why have they not?

1:02:30
James Pete WSOP, they're not included as the geological stores to be consented separately.

1:02:39
Yes, they understand that, but I think that what I'm asking you is the biomass policy statement requires that for all Beck's deployment, the full chain must be included in the calculations. And that includes the eventual store, I understand that you're not responsible for that eventual storage. But are those figures available? And have Have you looked as to whether they're available to include in in the calculations, because as far as I can see it at the moment, we have an incomplete calculation, which doesn't fit with what the biomass policy statement requires you to do?

1:03:15

Just bring out the biomass policy statement. I mean, this is you confirm precisely the language in terms of whether it says each carbon capture application must do must assess beyond its application, I mean, the carbon capture and store the transportation storage application will of course, have its assessment of the transportation, carbon emissions and the storage emissions. That is the application that will cover that and cumulatively, as well, with those projects plugging into its this application we're applying for, obviously, can't go ahead without that transportation. So what you need to be comfortable with is will the carbon emissions for this particular project hinder the government's ambition to get to net zero by 2050? And indeed, will it hinder the government's National determination contribution of 20 of 2030 and 30 anuses, compost 2035. We can't build without the transportation that will be subject to its own planning, application and determination, which we'll look at that carpet picture. And if that doesn't go ahead, then we can't go ahead. If that gets consent on the basis of on balance, the determining authority considers it acceptable, then we will go ahead. So there is that the assessment will happen. The Right Place for that assessment is the transportation and storage application. Okay, that's it Hi, I'm

1:05:01
Matthew Fox, mark the applicant, I think it's important to set that sentence in the policy statement in its context. Because when it refers to this assessment, it's referring to the government's development of understanding how banks will fit within its wider position and biomass and delivering that zero. So when it's saying this assessment, my reading of it is that it's referring to how the government assessing the role of banks within the wider picture

1:05:28
rather than rather than an individual. Yes, promoter. Okay, I'm required to do that. Okay. What I am going to ask then is, if you could submit a short statement or report addressing those those matters in relation to the biomass policy statement, and how you how you see it, in terms of those calculations, of course, we

1:05:50
will look at we'll go back to the we've only we've assumed you're referring to paragraph, three paragraph numbers in the policy, but it's page.

1:06:06
35, page 35. Is that your reference? Correct.

1:06:09
Where it talks about being genuinely incredibly net negative meaning it must, it says to me, it says that any Beck's deployment must be genuinely, incredibly net negative, meaning it must remove more greenhouse gas and gas emissions than it emits including supply chain to eventual store,

1:06:27
we will we will set out in a paper where we've heard opposition that it's your your role is to assess this application. And then the transportation application we'll look at to the we look at those emissions, we will set that petition out in writing with the phrase that you're referring to on page 35. We'll also add in in terms of the the sustainability aspect of the biomass supply chain, the biomass supply chain is already

in existence, this application will not change that biomass supply chain. And we're not asking you to consent to projects that will create a new supply chain. Under the current plants, they are governed under the renewables obligation or CFD, depending on which units we're talking about post 2027, and with Beck's, they'll be governed under the Beck's business model. And as the consultation on the vexmen business model, clearly says there'll be obligations in there regarding the sustainability of the supply chain to ensure that you get to carbon negative, so we'll set out those extracts from those policy statements, what the next business model will do in terms of financing of Beck's itself, and and the interpretation of the policy statement. And we'll do that for our deadline one.

1:07:41
That'd be great. Thank you. Thank you.

1:07:57
I think that's all I had to ask on greenhouse emissions. Before we move on to the next topic. Does anybody have anything they wish to raise? Yes, here it.

1:08:12
James Joyce independent, a number of things. Firstly, the power station in 2027, as the Africans sister said, run out three of the four in 2027. After that, there are big question marks whether they could carry on as a commercially viable concern. I contend that the review should consider that if the application goes ahead. The whole the missions and the harms and so on, should be deemed to be full this assessment for this project, not the past. It's not a continuation, it's a new scheme effectively. I mentioned short cycle analysis that I imagined is agricultural crops Miscanthus not slow growing wood from the USA or Canada. I don't didn't hear perhaps, figure if I didn't hear properly. There's this energy penalty, I gather about 30%. That has to may have to be made up somehow. The likelihood is it's going to be made from a gas fired power station or another pellet burning facility that those emissions that with respect should I think be included, making it really quite difficult to justify being carbon negative. The project is promoted as if it's a carbon saving project that the emissions occur in the USA. Surely then, the any co2 that is captured and stored should be attributed to the USA Not to the UK. Another one, the electricity system, I understand has to be decarbonized by 2035, as for unabated gas that then implies that Drax will be operating intermittently, where there will be considerable inefficiencies in capturing the carbon, the energy penalty will probably rise. And also the cocktail of a means and other things will probably change as well. Thank you.

1:10:37
Thank you, Mr. here that I will ask the applicant to respond on on your points. What what I will ask the applicant to do is though just to hold off on to the next part of the agenda item to discuss output because that is our next part of the agenda. I'm not going to ask you to repeat what you've just said when we come to that. But I will just ask the applicant, if they can just make a note of what you said there. And if they have any comments on that, at the next point in the agenda. Mr. Griffith, so the applicant like to respond.

1:11:07

Thank you. Taking note of what you said about the outputs, I won't comment then on the energy penalty. I would just say there's in terms of the operating scenarios, post 2027. That's in the application as to what the applicate applicants it is a likely scenario. And again, that is another agenda item. So I won't cover that will cover though, is the emissions point, which is going this GHG section agenda and I'll pass them on to Pete about whether the carbon should be attributed to the United States.

1:11:43
James Pete WSOP. So as you may be aware of the IEMA guidance for assessing GHGs and their significance within the context of EIA, she is now in its second version. The guidance states that you shouldn't be assessing schemes on their impact with and without the scheme. There's no provision in there to use political boundaries, or corporate boundaries for that matter. For assessments of GHG emissions, it's what is the difference in emissions with and without the scheme. So this scheme is two CCS units on units one and two. And therefore, regardless of where the wood comes from, the impact of the scheme in terms of emissions is negative parts of the finding balance.

1:12:47
So I didn't quite catch where you said that came from. Would you say? Ima?

1:12:53
Sorry? The Institute? Yeah, I should have used an acronym. The institute environmental managers and assessors. So for example, I'm a chartered environmentalist and my chartership comes through that organisation.

1:13:06
Okay. And again, is there any relevant extracts of that, from what you just told us there that you could submit into the examination?

1:13:14
Again, I don't see why not.

1:13:17
Thank you, if we could ask for that by deadline one as well. Please.

1:13:20
Do you mind if I just add to that as well? So Michael Goldsworthy from from Drax again, it's important to note the IPCC national inventory guidelines, those the means by which countries report their greenhouse gas inventory in accordance with their carbon budgets and their contributions towards the NDC nationally determined contribution to towards the Paris agreement worth pointing in the direction of the station combustion chapter. So Volume Two, chapter two, and the treatment of carbon capture and oxide. So I think section two point 3.4 which explicitly states that the negative emissions should be applied in the jurisdiction of the plant, and negative emissions shall be applied when a plant is fueled with biofuels.

1:14:12

And that is something that is the point that Mr. Goldsworthy but is that part of the extract that you've already said? You've got to submit in?

1:14:21
Yeah, it's it's it's separate.

1:14:25
It's the document I referred to earlier. Yeah. So that will be submitted.

1:14:29
Okay. Thank you. Is there anything else anyone wishes to raise under greenhouse gas emissions before we move on to output Yes, sir. Gentleman in the back there mr Harrell?

1:14:59
Good morning My name is Stuart Boothman, I'm from just transition Wakefield. I wasn't expecting to be here this morning because I was scheduled to be at work. But, you know, diaries sometimes get adjusted at short notice. So I'm here. So I wouldn't do to speak about greenhouse gas emissions this evening at the open floor hearing. If it's helpful, I could raise some of those issues now.

1:15:25
Yes, absolutely. Mr. Boozman, and, and as you weren't, we weren't expecting you to be here today, either. But you are more than welcome to come and join us at the table if you wish to do so as well.

1:15:33
Okay. Thank you. I'm struggling with this microphone. Yeah.

1:15:37
Wait, why don't you come and sit in one of these seats then?

1:15:53
You just press the button on the right. Yeah, there we go. Thank you.

1:15:58
Thank you. Is that better? Can you all hear me? Yes. Yeah. Okay. Firstly, a question for, for Mr. Pete. Specifically, what does what is included in the supply chain emissions? And And, Mr. Pete, you said that the biomass is rated as zero, and therefore the emissions are out of scope. And I think I'm interested in the difference between what is considered in scope and therefore accounted out compared to what actually goes into the atmosphere, which is what all of us in terms of our future well being are concerned about.

1:16:48
James Pete WSOP. So there were there were two questions there. The Forgive me, would you mind repeating the first one? I got the second one.

1:17:01
No, no, absolutely. It's fine. Stuart Boozman, just transition Wakefield. The question was, what exactly is included in the supply chain emissions?

1:17:10
I forgot that very quickly. Apologies. So it's the the whole value chain from the time in front of me. So we've we've we've got processing origin, the Feedspot, stock transport, drying pelleting, transport support, shipping and the rail to drags? Well, it's also important to notice the assessment included, because it's within the scope of this type of assessment, land, direct land use change associated with that supply chain, and the assessment states that that is zero, because there is no direct land use because of the supply chain of the biomass. I understand that the reason for that is that there is no additional change from one land use type to commercial forestry due to that supply chain. Second question was about zero rating. So the stated in the previous answer the guidance for all GHG Accountancy is to state that biomass is zero emissions, which is what we followed in terms of what comes out the top of the stack. Without it being captured, I should add, those numbers are in the assessment. So they're presented in line with the guidance, again, for information. I think the important point is that climate change is driven by the net change in emissions. So the scientific basis which sits behind the reason for all of that carbon accountancy practice to require us to rate it as zero is the concept that commercial forestry, you will combust the biomass, and then it will be regrown combusted. We've grown combusted. We've grown up in a cycle. And so over a period of time, there is no net change in the co2 concentrations of the atmosphere.

1:19:26
Thank you can I can I continue? Thank you. I want to refer to two specific publications. And there's a organisation called East SAC, the European Academy Science Advisory Council, who published in February 2022. Last year, their forest bioenergy update, subtitle Beck's and its role in integrated assessment models. And also John de Sturman et al 2018 in Environmental Research Letters, and to summarise eyes. What they say is that? Well, there are a number of points that they make, but the critical one is that the carbon payback period from clear failed forest is in the the timescale of decades to centuries to quote. And typically, if you're, if a clear if you're a clear felling an existing forest as opposed to a manage plantation, then the carbon recapture period for that will be well beyond 2100. And certainly well beyond our statutory legally binding 2050 netzero date and so, there is a carbon debt associated with all biomass or sorry, or woody biomass, which is difficult to argue with. And Sturman and Atal do go into some considerable detail about the causes of this carbon debt and how that can't really be. be amended. And I can go through that with you, if you would like but clearly, both the European Academy Science Advisory Council and John Sturman and company have made the point very, very clearly that the time it takes to recapture that carbon from Clearfield forest is too long to contribute to Paris Agreement targets. The other point that they make very clearly is that a biodiverse natural or naturalised forest is much more carbon dense than a monoculture plantation. And so even if that land is completely replanted, which isn't always the case in the southern US, because there are swamp clearances going on for other development. But even if that land, is replanted, the forest is never going to fully recapture the carbon that was emitted from the original clearing. And then is is further harvested and re harvested, then that initial carbon debt never actually gets paid off.

1:22:17
Okay, Mr. P has been extremely helpful and a lot of detailed information. Like that's what I was going today. And I was going to suggest, in particular for the applicant to try and respond to all of that on the spot right now would be most helpful if you could put that to us in writing so that we can have a read of it and consider it in detail as well. And if you could submit that to us by deadline, which is the second of February, that would be great. And then that would also give the applicant time to take take that into consideration and provide a response to that to Mr. Griffiths, are you happy with

1:22:53
that? I? Yes, we will, of course, receive, read what is submitted and respond in writing, I would just add to do that we're not applying the supply chain is already in existence. As I've already said. Secondly, we're not consenting a new biomass Generating Station. The sustainability aspect of the biomass is governed under other regimes, as his very as is, as is an EN one and en three, and indeed, draft en one and dr. D. Three, make that very clear that other regimes govern the sustainability of biomass. But more importantly, we're straying very carefully, dangerously now into policy, and section 106, the Planning Act territory. So I just want to highlight that we need to be careful here, that I think what we're what's being attacked here is government policy. And it's very clear in a raft of policy statements, not just from the national policy statements, but in other policy statements from 2018 through to 2022. And indeed, on last Friday, it although not a government policy, and it's an independent review, on called Mission Zero, by the Right Honourable Chris Skidmore, that very clearly says that the government's policy to meet their legally binding targets that power banks plays an important role in November 2021 biomass policy statement says that on based on their government's evidence, which is backed up by the committee, climate change committee and the National Infrastructure commission, so independent bodies advising the government, that power backs, could be a major greenhouse gas removal technology in the period of 2050. Thanks to opportunities to retrofit existing large scale biomass plants. So I just want to highlight we always like to respond in writing to the submission made but I think we've got to be careful here that the not to entertain elements that are policy criticisms, which of course is outside the remit of this examiner. Should we all respond in writing when we see?

1:25:02
Mr. goes? Absolutely, you know, just just to complement it, it is it is not within our remit to examine the merits of government policy. But I think this was meant to refer to a couple of papers that might have other evidence in terms of what calculations shouldn't be taken into account. And perhaps once that's been submitted in writing, you can consider that and respond.

1:25:22
If I could just add very quickly, the the assessment has been done in line with the relevant guidance. And the reporting factors which the government uses will not be credible to support to depart from those individual academic publications, which may or may not be contested. So we'll obviously reply in writing to your

1:25:46

position. Yes, just do you put that and obviously we, as the examining authority will will consider all points. Okay. I think it looks like an appropriate time to take a break unless anyone else has anything they wish to raise on on this matter.

1:26:08
So the times other than 25 now, so I suggest we we come back at 1145. And can I just remind anyone watching the live stream that when we do come back, you will need to refresh your browser to be able to continue viewing the hearing. Thank you