

# East Anglia\_ISH2\_2ndDec\_Session 4

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00:06

Good afternoon, everybody. And welcome back to the fourth session today of issue specific hearing number two. My name is Rynd Smith, and I'm the lead member of the examining authorities appointed to examine East Anglia, one North and East Anglia TWO offshore wind farm proposals. Before we go any further, Can I check with the case team that the live streams are now running and I can be heard?

00:36

I can confirm we can hear you Mr. Smith in the live streams and recordings are running.

00:41

Excellent. Thank you very much, Miss hope. Well, that's all good news. Ladies and gentlemen, we are now on agenda item three strategic siting approach. Now in terms of taking these we have three sub items A, B, and C. And in relation to B and C, the applicants have prepared a submission and that has been posted on the planning and spectris websites on both applications. So they have prepared a presentation that will take us through their position in relation to the content of B and C, and we will ask them to introduce that in due course. However, before we do so, I would like to make progress on two elements. Firstly, I did flag earlier that before we moved formally into A, B, or C, I would have a touch point with those interested parties present representing the elements of the nuclear industry size wells, A, B or C who are present and indeed, the O nr. And on three very particular points that relate to item three, taken as a whole. And so, what I will do is I will now introduce any of those interested parties who want to speak to the following points. The degree to which possible transmission connection locations requiring a shorter cable route from a thorpeness landfall, as currently proposed have not been pursued because of one or more of the following matters that have been raised in a number of written submissions. The first of these is a need to safeguard land or access for works associated with nuclear decommissioning, or nuclear new build it size or a possibly B and C and a need to safeguarded land or need to safeguard land for mitigation measures associated with nuclear decommissioning, or nuclear new build. And again, at any of those projects. And also whether there are any issues arising from regulatory or emergency strike incident planning or risk management measures that run to a need to avoid the aggregation of new useful development associated with these applications onto land in close proximity to sizeable A, B, or C. Essentially, what we're trying to wrap our heads around here is the degree to which there are hard or indeed soft constraints within range of of size. Well, that should be taken into account. Now the applicant has already made very clear submissions on these points. And there are also points. There's there's also analysis set out in the application documents on it, but we felt the need to test those points back with sizewell related interested parties. So can I just check? Are there any of the sizewell related interested parties who would be able to respond on those particular points?

04:09

Hello, says Richard ball from SEAS will see I can respond.

04:13

Thank you very much. Before you do Mr. Ball, can I just check whether any of the other sides or parties or Oh nr have any wish to speak on this item, as a show of hands will be enough? Hopefully they're working now. I'm not seeing any other hands, which may mean that they're not working now.

04:43

Generation admittedly the new owner and occupier of size will be and we don't have anything to add last point at this time. Okay.

04:50

Thank you very much for clarifying that. So I will go then to Mr. Bull. And that will be sufficient. So Mr. Bull

04:59

Hello. So just to say we engaged quite thoroughly with the applicant with regards to the potential siting of the substation on the existing science world, the new cogeneration land. We currently have that as mitigation land for reptile mitigation as part of our project. And should that site have been forthcoming, we would have worked or continued to work with the applicant to find alternative reptile mitigation land that could have been substituted for our mitigation for our project. But obviously, when the consultation for that location was completed and the Friston site was chosen, then that engagement was completed. We've obviously have continued the development of our project alongside the SPR proposals, and you know, that land at least and that science well is still in place for reptile mitigation. So should that forthcoming in due course that would create a potential issue that would need to be resolved with regards to our project? Thank you for

06:37

that Mr. Bull. Mr. Smith,

06:39

Mr. Smith is frozen on us. Yes, I am back now but I do seem to be suffering it distinct, appalling internet connection to reassure am participants in this hearing of course, everything is recorded. And even if I drop out for a few seconds, I am able to essentially wind back after the event and just remind myself of the one or two bits that I have I have lost. So there is no need for fear that anything is not being heard. Because it will be and thank you very much Mr. Hockley for jumping in on my behalf again, and apologies that the internet gods are not looking after me. Well, this afternoon. Okay, so we have heard from Mr. Ball there. And that that that's useful. That's cleared up a point there now, do any of my panel colleagues have any questions that they want to put in relation to, to that matter? No. Okay. Well, in which case, we will then move formally to agenda item A for all other participants. So if we go to the applicant first, and what we're looking at is the short the rationale for the choice to make a new onshore connection at this location, as opposed to utilising or expanding existing connections, boards, or indeed creating new connections as well. And what we had in mind when we said that was the degree to which certain interested parties had also raised a brownfield connection option of Bradwell or equivalent. So,

essentially, if I can ask the applicant to set out their stall in relation to this item, tell us the coherent story of the move from board z. And also in relation to others, having pressed the concept of a possible Brownfield connection Bradwell or equivalent was, to what extent was that considered, and how was it dismissed? And, and, and if I can just say from its genesis guidance here, and we had taken it, that's you would bring forward your broad presentation on citing considerations, constraints, et cetera, which has been useful at agenda point, B. If, if that makes sense. Yes, sir. Mr. And so

09:25

take I like sir, you're just frozen Colin Innis on behalf the applicant in terms of responding to this section. What we propose to do is our initially, very briefly set out a context, and then I'll invite essentially, a specialist response to deal with the technical matters from Gavin green. And I think importantly, as we've said I in the regulatory note, how the electricity industry is broadly regulated with a particular focus on grid. The electricity act 1989 set safe that legal framework. And in that context, the regulatory framework has been developed, really from protect state of privatisation into those broad areas of those which are essentially mean monopolies are regulated and off gem has a key role in ensuring that they meet statutory and their rapidly licenced duties. And in that context, that continues to be the broad framework in which the electricity industry operates. And we come before you as an applicant as a generator. And what we are seeking is the consent to design and build also the grid connection, which comes within the off to regime and also the consent for the the National Grid, at substation, and connection to the overhead 400 kV line. And I think fundamental to this, and you're about to hear about the Bitcoin process. But that is a fully regulated process in the sense that national grid, ESA is exercising its regulatory function in essentially affording fair and free access to the national grid to generators. And that is one of the fundamental premises of the electricity act 1989 is to allow and foster competition in generation. And that was felt to be done by ensuring that those who had control of the assets required to make them available on fair and clear terms to ensure that there was fair competition, and that there was robust competition in the generation sector. And that perhaps helps drive some of the ways in which the approach to the coin process is delivered. And equally as part of those processes. National Grid at ESA, and transmission level have to ensure that the grid is economic and efficient. And I think it is important to set those those clear obligations, because that is what drives the coin process. And at the end of the day, the selection of the overall preferred connection option is one which in terms of the letter which is circulated by national grid, the essay will ensure that the most economic and efficient design connection option is developed for the overall benefit of the Great Britain consumer. And I think it's particularly important to understand that statutory context and and the application of it through the regulatory framework, and understanding the coin process, which essentially seeks to achieve at that particular objective. Now, I'm not going to hand over to Gavin green, who had introduced earlier this this morning, that he is the from the engineering department manager of scottishpower renewables. And he will take you through those technical aspects in relation to the client process, which has resulted in the decisions that have been made. So I'll now hand over to Mr. Green.

13:19

Thank you, Mr. Gavin green on behalf the applicant. So I'll take you through the process that we've walked through the last 10 years about how we've developed the grid options for sangra one North East Anglia two and I think part of it starts with the responsibility of the generator initially made a good

connection application, the very first one and 2010 and in a sense of the whole process, whereby we then are today with connection options in front of us. So as discussed they are the other coin or the connection infrastructures options note is a key document that helps define that a failed connection location for the generator and the connection at the phase options notes and evaluates the respective transmission options required, which leads to identification and development overall efficient coordinate an economical connection point or ensure connection designs and applicable off your transmission system or interconnectors and laying the obligations to develop and maintain as efficient and economical system. The conventional structure option is not required records a commonly comparative assessments of the options and we go through what those were for in Sangha two and one north. The assessment is led by National Grid as the operator of the alterus Jessie transmission system, no nget yes all and enter is included from scottishpower renewables sales representing applicants and at the same time they're trying to the future To offer your transmission or not, and from the onshore to transmission owner and National Grid end gate will also provide them to this process to help identify the preferred connection options. The coin, as discussed is required in order to demonstrate compliance the test the Act provides us with competitive option to connect your generator to the good we ever seen as the quality against other generators and a competing market. And the coin in allows us to have as economical connection so that the alleged entity was connecting to the National Grid System out on a compatible basis. Other elements about the coin, and what can take out an update to the coin. So as we've worked through these projects last decade, there's a number of trigger points which will then drive a review of the coin.

So isn't a static document at one point in time, that can change with some key trigger points. So material triggers, or any change affect the overall design connection point that will require the need to review the connection options. If these changes are deemed material by the coin parties, ourselves, they don't show to you a national grid. So, then any of your systems and design options will fall under the modification process as defined in the cost and HDCP 18 dash 11 these are technical documents that govern our national grid interacts with our sales process is initiated by the ESO, the development fuse will take power in the form of a modification application which is a drive to request the update to the coin or a modification notice which is imposed by National Grid plus significant developments and they are saved. So examples of the material changes and outside the ones relevant to will be our changes in the so assumptions, such as African changes in construction planning assumptions, or generation background changes to assumptions such as changing generation bargara. And again, the impact on your investments and affects construction planning and changes in the developer assumptions such as changes in the transmission engine capacity, effectively, the amount of megawatts you want to export to the grid, changes in technology, changes and programme. Any of these are significant material may drive a review of the coin process. It talks about time some other factors and when we're looking at connection options for projects because of you, and again, the CFO a bit more detail and and all that.

17:47

But Mr. Ennis discussed the earlier looks at both the capital costs from the transmission assets, the weight on assets that are beyond the physical walks that we are claiming consent and maybe upgrade to the network, developer capital costs, that includes the development costs, offshore surveys, etc. and system operator constraint costs and so connecting the constraint our systems those payments to other

generators to get them off the network. So, the costs are more than just the practical capex costs off the the off tool assets or the generators transmission connection. And this is okay to see the cost benefit analysis by National Grid eso and then they'll provide their recommendation on their failed options. So, we provide some data into our general costs, programmes and relevant technology, they will modify inputs and come up with the recommendation.

18:52

We can briefly on this because you know, the background is reasonably clear. But essentially what we are interested in is the process and timing around essentially what seemed to us to be an initial proposition that these projects would connect at bawdsey. And that there would therefore be a mechanism for them to make the transmission and connection at the substation. They're the point at which that shifted, and essentially summarising why that shift occurred and what why we ended up here.

19:35

Okay, so I'll go straight into the timing. So original connection agreements were signed in November 2010 and identified six 1.2 gigawatt projects or thereabouts connecting to knowledge means substation with 1800 megawatts on fourth substation, which is probably also referred to as Boise because that's the landing point to get to Brownfield of 3.6 gigawatts, and another 1.8 gigawatts to be connected to a new substation not identified around the birth of deaths or I airfield, which is quite a bit fallen in line from where Western seismic was. So the original connection agreements, we had four parts of the Northern project and these Angular two were for a new substation, and the desk if area. As you as you rightly say, we did have three projects, your mark connecting to bramford via the Baji landing point. So in February 2015. As you're aware, it's Angular one offshore wind farm was awarded a CFD for 714 megawatts with a grid capacity of 680 megawatts. The impact of that was we had to material change the connection options for that project to get the economic efficient connection and the most advanced technology to get the lowest cost connection was deemed as an easy connection. And because of that change, the cable corridor suite we had secured for that get a loan for the East Anglia one project and the East Anglia three project which is company unsterilised dc project. So the cables we constructed a load those two projects to be connected. So I lock key points around the time in August 2015. And there is the IoT EP the integrated offshore transmission to the east coast is a collaboration coordinated by National Grid eso and involved developers from Dogger bank Hornsey and sales is angular reviewed the options for integrated offshore assets and bootstraps and collector platforms for multiple projects. And we looked at a range of options. And the summary of that was that as a result of the project, the team does not believe it'd be economically efficient to progress, the development of integrated design force for delivery of intangible assets. It's time time that we are modifying these connections. The current thinking was that within the regulatory regime and policies at the time, that the point the point connection, especially for the Sigler, one was the most economical efficient way to deliver it.

22:32

So it 2016 early 2016 we effectively agreed the connection option for East Anglia one army formed East Anglia, one North project with the remainder of zone and some seabed laws that define this new project area. At the same time, we also developed these languages to project capacity and a more realistic

values. So now we have the 900 megawatts for this angular two and 800 megawatts dead Python is Angular, one north node. On the tech register, we have connection capacities of 860 megawatts, which will be tied up with the actual project size. And so at this point, we then it's quite clear that we had to review the connection options for these projects, because there was not a pre constructed a connection option for one of the projects and the other one was expected to be landed somewhere on your desktop I interviewed. So, we went through a coin process again on that basis and review the number of connection points. So, October 2017, the coin process reviewed a number of sites and I can list these out quickly, but the dead include broadwell and the existing connections for existing projects of bramford and please Kumar Bacchanalia which may be other projects that and other areas and datum this an airfield which I talked about earlier qinglin at least in area, little Dunham nektan and last of an existing sites or knowledge means of station size well in Walpole. So it's quite a wide area to be reviewed and went through electrical options appraisal and running through that we just counted quite a number of the connections. So I think the equation has been asked specifically about broadwell and we have some direct feedback from national grid on why a discounted connection option from the initial appraisal walks required to connect the project with acquire a new 400 kV substation broadwell an extension of the substation near a second overhead transmission line to connect Bravo to really substation so estimates as the crow flies This is a 25 kilometres cubed acquire up to a 35 to 40 kilometre double socket overhead lane to connect these, if I'm not.

25:10

So if I can, if I can just interject there, then the principle difference there if one puts it on comparable terms of where we currently are would be that if you made an equivalent connection to the sizewell transmission alignment, but you actually had to deal it in order to make that connection. And that would be an equivalent project

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Yes, a sizable company has to two double socket overhead line and it has quite a significant capacity. So that's one of the reasons why that touch on why size was real dope initially in 2010. And that was back in but yet the effects is that the works and again national good should respond directly on this but what they advise those and during the coin process was that click Allow us to connect these projects abroad or require new overhead lines to run and parallel to the existing lines they are which is a significant undertaking. The other states discounted and include knowledge for the KV substation at a later stage so go back to sorry the initial options appraisal we discounted last night again Dr. Bill Cromer back and most often because of extensive professional overhead lines also ruled out Whirlpool Kingsland little dine on datum airfield and as an airfield, and because the locations offer no benefits in terms of network infrastructure savings, although given a greater distance from each angle to project longer runs, your cabling will be required the greater environmental part in greater cost. So effectively, it was called Safe course of the safe, which would require less on shore new walks, the winds were carried forward, including nodige sizewell and then around the listing area. We had originally called at least in for the KV substation, and again, like those been through the evolution of the process with those identified more specific areas, and that's why we're calling it Friston and the Branford substation. So next phase of the review, we go into more detail in terms of looking at the economics from our site in terms of the cost to connect to these sites. And typically what we will do is work out the most economical efficient way to connect to the sites. And so we are picking the technology, we feel the most

appropriate for the different connection options. And some points packed up and through the discussion about the technology selected and the innovations that we're employing. And so just to go back to Sigler, one project is at the time reconstructed and delivered that was one of the biggest EC connected projects on a double socket. And we demonstrated that we can have high capacity, AC connections, we're connecting our 220 kV, which is the operating voltage and of the cables, and that allows us to get more power during each cable. And for the projects, we are considering the sangla one north and two, we're going to step up the cable voltage to 75 kV, which allows us to get much higher capacities per socket. So it means we can get more power through the cable corridor and have a much reduced footprint per megawatt at the onshore substation.

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So the factors that we are considering here is that we are constantly engaged with the supply chain, looking at the innovations and the new technologies coming along on both alternating current as well as HVDC. And there's other factors here in terms of the just to consider when you're considering an HVDC project. The terminal costs ie the substations offshore and onshore forms the largest parts of the cost of the asset and the cable as a more minimal cost. Whereas with AC substations, IR and R Donnelley are much smaller costs than a lot of times, but it's the cost per kilometre to connect it and and we've seen the drive in terms of the efficiency of the systems, the connection distances that we can get economical efficient with ACR significant in excess of what we see in East Anglia one, which is 120 kilometres, we can see connections of AC long are not that efficient. So for example, the connection distances we have for East Anglia one north is currently around about 70 kilometres in total, and recycled to it's about 60 kilometres in total. So part of our cost assessment of the capital costs that we presented in the coin process looked at these technologies The costs and it was provided to national grid to review an overall assessment of the preferred connection options. They've gone through a process defined in their letter under coin guidance, which ranks the projects and comes up with the least cost integrate solution, and fundamentally is indicated that a substation entering the eastern area would be the most economical efficient connection of the project. Even though I can ensure that size well would have been the lowest cost, the difference was marginal. And maybe my colleagues later will discuss about the ability to actually physically build a site that size Well, the connection to Branford for these two projects. because of the proximity to the shore and the distances involved, it was quite a drastic increase in cost to go to Brownfield and we will also have to connect the Branford after construct in conversion of a new underground cable system from a new land 4.2 Brownfield, we cannot use the existing cable route because that has cables and already and a number of the punch points. And there's no space to bring more cables. And so you'd have to select the other crossings at some significant points.

31:21

So

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the conclusion then from the coin in 2017, was that substation and around the listening area and afford if kvk action was the most appropriate that design did not specify exactly where it was, but within a rough radius of maybe five kilometres. And again, I call it later, we'll take you through the process of how we identified allocation for that. And it are key drivers in the drive to the latest mechanic, there was changes in the auto the background generation and capacity on that transmission connection. And

which loaders then connect the key projects they are accurate the pilot along those size wheel overhead lanes.

32:11

So

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I can add more details to that if required. Somebody I'll give just a thank you.

32:18

that's a that's a kind of reasonable headlines. Henry. I've got one questions I wish to probe out of that. And then my colleague, Mr. Rigby, I believe might have a question. And I mean, drawing that together in terms of the specific move away from boards, the stroke Bramford in a nutshell there, it was simply the in combination economic benefit as assessed using the method that you have laid out. That took you to the current connection and position there was no immediate other kind of blockage or reason why you could not have ended up acting at board stroke Bramford.

33:08

So, Gavin Green, and Bafna applicants, so other elements considered the initial options appraisal also considered technical risk and consenting risk. And when we're looking at the options to connect to Sita Bramford, for example, or at least in our size, well, the technical and the consent risks, were not rGc showstoppers are significant enough to stop the progression. So there is a consideration to these factors before we went into the economic assessment. So effectively, economic assessment was carried on for feasible chemical, vitamin two options. And that's just and also to reiterate the original connections to brown footwear field projects. And the connection options. We had also included one and a half projects, 1800 megawatts. And you saw if if you so they we had to look at connecting that project, which hadn't been defined well enough, as well as the residual office angle, one more.

34:16

Yeah, no, that's that. That's, that's clear to me now. Excellent. No, thank you very much for that answer now. Mr. Rigby.

34:24

Thank you, Mr. Smith. Thank you to the applicant for your submission there. I was listening about you're mentioning the rationale for the choice or not various connection points. I wonder what about the cost of the intermediate stabilisation stations that you need for AC transmission? I acknowledge that your turbines generating AC and that the National Grid network is also an AC and that therefore you would say let's go for AC because there's no need to make Can he changes to redirect or to the mode of transmission as it were, but direct currents is obviously more economical for longer distances. because presumably of the cost of stabilisation of AC, I wondered whether you sort of chosen AC rather than DC to start with and then said, Well, actually, it's too expensive over long distances where the where the cost of the AC stabilisation comes into your thought your thinking.

35:37

Thank you, Mr. Gavin green on behalf the applicants. So they some of the developers with its tremely long connections are talking in excess of 150, maybe 200 kilometres, that has an effect. And it's getting a bit technical here that because the AC voltage behaviour on the cable turns into what we call a capacitor, and you have to build this rate of balance and that an either end with what we call reactors and that forms a large part of equipment on the onshore and offshore substation. However, when you cable, it's extremely long, but the effect is also a balancing point. And at the same time, that's where we have in some AC schemes, if and the options to have these compensation stations partway along the cable. And we have not acquired these on Langley one, we have probably had a limit and a large project with those technologies at that time with the transition to AC without an engine compensation station. These projects is angled one north and two are significantly shorter. And so we have no concerns about requiring interim compensation stations for vcac projects. Thank you for that.

36:54

I yes, I know what you say that you're on the limit with East Anglia, one, northeast Anglia. Two. I was just wondering whether that meant that that was the reason you discounted alternative connection points simply on the basis that you didn't need them for. connection for in the you're proposing?

37:13

Well, yeah, so again, we're not against the rhetoric, we're not on the limit with the transmission distance, and etc. For example, one north and two, when we designed this angler, one of the most potent which is constructed at that point, we were pushing the boundaries of the Time Machine technology, we may have understood that and we know how best to manage the extra longer distances. And so for example, if you are connecting to a further offshore offeror locations, onshore, and we still be using AC for a fair more assessment longer than we currently have. And that would then proportionally drive up the cost of that connection. And when we're talking about DC, and for example, an instance Anglia, free, which is connected to brown for the total length of that is 180 kilometres. And that is the point at which DC becomes cost effective. And there's also a factor there, that the cost of DC is quite fixed, regardless of whether it's 800 megawatts, or 200 megawatts because of the nature of how it's built. So it's not as linear, the cost increase for DC versus AC. So when you're looking at cost efficient projects for DC, you really are trying to push the transmission limits or flat to maximise the capacity of the system. Whereas if you have to build a smaller DC connection of eight or 900 megawatts, and we still whipping broadly some operators as we would for the 1200 megawatt DC connection.

38:54

Thank you.

38:55

Okay. Now, what I'm going to suggest, then, is that having, unless there are other points that my panel colleagues wish to raise, having brought that position from the applicant out, I'm then going to invite the applicant to proceed directly with agenda items B, and C. And I'm going to offer speaking opportunities on the bundle to the other interested parties when we have marched through all of the material because I think in in that way, we will actually get coherent and integrated submissions from the other interested parties, and will probably minimise the amount of time that we need to use. Now, looking at the time, I

think it's very clear that it would be ambitious to expect that we will end in 15 minutes, there is absolutely no likelihood of that. However, I would ask for everybody's indulgence that we look at a sort of 530 closed points and try to make sure we can get Have the material within that sort of time frame? And can I then ask Mr. Ennis, to introduce the material for items B and C, which will, I believe require the sharing also of a document, Mr. Williams, or miss Hopewell? So we do have the applicants presentation available?

40:24

Yeah. Mr. Innis on behalf of the applicant, um, the issue about doing B and C together plus a is it exceeds the number of seats that I have available for presentation. So I would need a break. And the would have to be a certain element of cleaning before those replacements were brought on as it were. And equally it may be difficult for if there were subsequent questions to be asked that people would have to come in and act arising from if there's anything that arises from other discussions. So I'm not averse to it I'm sure we can manage it but it'll need a five minutes adjournment at this point to 10 minutes adjournment to reorder to get us the people that you need for that presentation.

41:13

Okay, I'm on balance. loads, I am to adjourn for 10 minutes right now in the teeth of the end of the law business day. I think that's a decision that we should take. So we should step down now and return at five minutes to five, because I think we will find ourselves moving through the material much more efficiently thereafter. So ladies and gentlemen, let us adjourn now and return five minutes to five. I thank you very much