SUMMARY OF ORAL CASE AT ISSUE SPECIFIC HEARING 1 AND OPEN FLOOR HEARING 1

Drax Bioenergy with Carbon Capture and Storage

Infrastructure Planning (Examination Procedure) Rules 2010 - Rule 8(1)(c); Planning Act 2008

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AUTHOR: Matthew Fox

APPROVER: Richard Griffiths

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1. INTRODUCTION

1.1. PURPOSE OF THIS DOCUMENT

1.1.1. On 23 May 2022, Drax Power Limited ("the Applicant") made an application ("the Application") for a Development Consent Order (DCO) to the Secretary of State for Business, Energy and Industrial Strategy ("the SoS"). The Application relates to the Drax Bioenergy with Carbon Capture and Storage (BECCS) Project ("the Proposed Scheme") which is described in detail in Chapter 2 (Site and Project Description) of the Environmental Statement (ES) (APP-038).

1.1.2. The Application was accepted for Examination on 20 June 2022.

1.1.3. This document, submitted at Deadline 1 of the Examination, contains the Applicant's written summaries of oral submissions made at hearings in the week commencing 16 January 2023, including responses to post-hearing actions.

2. ISSUE SPECIFIC HEARING 1: SCOPE OF THE PROPOSED DEVELOPMENT

2.1. INTRODUCTORY REMARKS

2.1.1. Issue Specific Hearing 1 was held at 10:00am on 18 January 2023, both in person at The Parsonage Hotel & Spa, Escrick, York, YO19 6LF and using the virtual platform of Microsoft Teams.

2.1.2. Issue Specific Hearing 1 took the form of running through the items listed in the agenda published by the Examining Authority ("**The ExA**") on 13 December 2022 (the "**Agenda**"). The discussion predominantly focused on:

1. the components of the proposed Drax Bioenergy with Carbon Capture and Storage ("**BECCS**") project (the "**Scheme**");
2. the need for the Scheme;
3. the Scheme in the context of the East Coast Cluster; and
4. the consideration of reasonable alternatives to aspects of the Scheme.

2.2. AGENDA ITEM 1 – INTRODUCTION OF THE PARTICIPANTS

2.2.1. **The ExA**: Caroline Jones and Ben Northover.

2.2.2. The Applicant:

1. SPEAKING ON BEHALF OF THE APPLICANT: **Richard Griffiths** (Partner at Pinsent Masons LLP).
2. Present from the Applicant: **Jim Doyle** (Planning and Consents Manager), **Richard Bass** (Head of Commercial Development), **Iain Harris** (CCS Cluster Development Manager), **Michael Goldsworthy** (Carbon Markets Development Lead), **Luke Varley** (Head of Engineering), **Chris Summers** (Technical Manager – Operations), **Steven Foster** (Environmental Regulatory Manager) and **Catriona Reynolds** (Senior BECCS Strategy and Engagement Manager).
3. The Applicant's consultants and legal advisors: **Alexis Coleman** (Senior Associate at Pinsent Masons LLP), **Matthew Fox** (Associate at Pinsent Masons LLP), **Nicola Ashworth** (Environmental Assessment and Consents, Associate Director, WSP), **Matthew Stocks** (Planning Consultancy, Associate Director, WSP), **Bethan Tuckett-Jones** (Air Quality, Technical Director, WSP) and **James Peet** (Associate Director, Carbon, WSP).

2.2.3. Other parties:

4. Selby District Council: **Jenny Tyreman** (Senior Planning Officer).
5. North Yorkshire County Council: **Kelly Dawson** (Senior Solicitor) and **Michael Reynolds** (Senior Policy Officer (Infrastructure)).

6. Environment Agency ("EA"): **Chris Gaughan** and **Matthew Wilcock** (Planning Specialist).

7. Biofuelwatch: **Katy Brown** and **Merry Dickinson**.

8. National Grid Carbon Limited ("NGCL"): **Oksana Price** (BDB Pitmans LLP).

9. Just Transition Wakefield: **Stuart Boothman.**

10. **James Hewitt** (independent).

11. **Michael Chaloner** (independent).

12. **Sara Robin** (independent).

2.3. AGENDA ITEM 2 – PURPOSE OF ISSUE SPECIFIC HEARING 1

2.3.1. The ExA set out the purpose of Issue Specific Hearing 1 to all parties.

2.4. AGENDA ITEM 3 – COMPONENTS OF THE BECCS PROJECT

EXPLANATION OF BECCS

2.4.1. **The ExA** asked the Applicant for a brief explanation of BECCS, including the post-combustion carbon capture technology and the processes involved.

2.4.2. **Jim Doyle** spoke to the presentation submitted to the ExA prior to the hearings [AS-096].

2.4.3. **Jim Doyle** began by providing an overview of the components of the process. The quench column cools the flue gas before it enters the absorber column, so that the solvent in the absorber column is at the optimum temperature to capture carbon dioxide ("**CO2**"). In the absorber column, the solvent interfaces with the CO2 from the flue gas, chemically binding to it and trapping it, thus removing it from the flue gas. The flue gas is then directed back to the main stack at the existing Drax Power Plant (the "**Plant**") and is emitted to the atmosphere. The solvent, within the CO2 trapped within it, moves through the system via ducts until it reaches the generator column, which splits the CO2 from the solvent, with the solvent then being captured and reused (i.e. transported back to the absorber column). The CO2 itself is directed out of the generator column to the compressor system, before it enters the transport and storage system.

2.4.4. **Jim Doyle** then presented a slide which solely showed the existing post-combustion capture system within the Plant. This comprises of a flue gas quenching column, to cool the flue gas, a taller absorber column, a regenerator column next to this, a solvent storage area and a CO2 compressor unit behind the absorber column, with flue gas ducts interspersed with the infrastructure for transportation.

2.4.5. **Jim Doyle's** next slide provided a wider view of the current layout of the Plant itself. The southern cooling towers serve Units 1-3, whilst the northern bank of cooling towers serve Units 4-6. In between these batches of towers is the main stack, with the

flue gas desulphurisation plant ("**FGDP**") adjacent to that. It is proposed that the main BECCS plant will sit on top of the FGDP, which currently serves Units 5 and 6. In front of the FGDP, there are combustion units, a turbine house and then the National Grid 400kV substation.

2.4.6. The following slide provided an image showing the red line boundary for the Scheme. **Jim Doyle** noted that almost the entire curtilage is owned by the Applicant, including the field that was previously used as a laydown area.

2.4.7. The ensuing slides provided closer images of the various Works (as numbered in the draft DCO) proposed as part of the Scheme. This included the BECCS proposals, the common solvent storage and makeup system, CO2 compression and the options identified by National Grid for their aboveground installation. The slide deck ended with an indicative ariel view of the Scheme alongside the existing Plant, with BECCS proposed to be sitting to the north of the main stack.

2.4.8. **James Hewitt** queried whether there will be an interruption in the flow dispersed from the Plant, given that the non-CO2 emissions will go back up the chimney of the main stack. **Jim Doyle** answered that whilst the quench column cools the flue gas, the heat exchangers then re-heat the gas, referencing the Air Quality chapter of the Environmental Statement which identifies the temperature of the gas and the velocity of the emissions [see table 6.17 of APP-042]. The Scheme will slightly alter the dispersion, but **Jim Doyle** noted that the Air Quality chapter provides the relevant modelling and clarifies that the change of emissions is very subtle.

2.4.9. **The ExA** noted that, in the context of Work No. 1A (water pre-treatment plant), the Explanatory Memorandum references "better quality water" and queried what this means. **Chris Summers** answered that the capture process uses extracted river water, via heat exchangers and coolers. The Applicant is looking at cleaning up and polishing the water, in order to achieve the best efficiency through the coolers for the process, which in turn leads to a better quality of water. **The ExA** followed up by asking whether the process could operate without this work being done. **Chris Summers** confirmed that it could, but it would be less efficient – the capture process is a thermal process, so increasing the heat interaction process via better quality water is key.

2.4.10. **The ExA** noted that the Explanatory Memorandum suggested an increase to the operational capacity and duration of the Plant as a result of these works. **Chris Summers** stated that cleaning the water will also lead to additional benefits to the Plant via the current operating units. The reduction in sediments within the water is beneficial across the Plant, but this is via increased efficiencies, rather than an increased output.

2.4.11. **The ExA** queried why Work No. 1B (upgrading and extending the water cooling system) is required for the Scheme. **Chris Summers** answered that the process requires thermal interaction and that the Applicant's intention is to reutilise existing redundant infrastructure as part of the Scheme, such as the cooling towers, cooling water pumps and various pipework.

2.4.12. **The ExA** asked for an explanation of why Work No. 1C (upgrading boilers and turbines) will result in greater efficiency. **Chris Summers** noted that this is in the context of efficiency for the Plant as a whole, burning less biomass for the same energy output. The BECCS process requires a steam tap to be taken from the host unit's generating plant, Work package 1C(i)(aa). This steam tap will feed a number of BECCS processes with heat to ensure that they function optimally. The removal of heat from the host unit will require the associated generating plant to be modified and upgraded in order to ensure it continues generating electricity as efficiently as possible whilst still feeding the BECCS systems with steam. Combined power turbines will make optimum use of the steam prior to entering the BECCS systems thereby recovering useful energy.

2.4.13. **The ExA** asked if all works proposed as part of the Scheme are necessary in order to progress BECCS. **Richard Griffiths** answered in the affirmative. Without Work Nos. 1A and 1B, the Applicant will not be able to operate BECCS efficiently, as these are essential to the capturing of carbon, and the remaining works are required to construct Work Nos. 1A and 1B. The Applicant has only split out the proposed works in order to provide an indication of the packages/plans and the relationship with the Plant. **Richard Griffiths** confirmed that the generation output of each of Units 1 and 2 (being 660Mwe) is not changed by BECCS – instead, what changes is the output to the National Grid, which is estimated to drop from 645Mwe to 450-480Mwe due to the extra energy required by BECCS itself.

2.4.14. **The ExA** wished to clarify that there are four biomass units currently operating on the Plant, which **Richard Griffiths** confirmed is the case. **The ExA** then queried why the Applicant is proposed to install BECCS on only one or two units. **Richard Griffiths** noted that this is a commercial point, noting the BECCS Policy Business Model (the **"Business Model**") from the Department for Business, Energy and Industrial Strategy ("**BEIS**"). It is currently considered by the Applicant that the installation of two BECCS units is the likely scenario to receive assisted funding from HM Treasury. Whilst there is the possibility of installing a third BECCS unit in the future, this is subject to HM Treasury and other considerations – though it was noted that there is space within the Plant to accommodate this additional unit.

2.4.15. **The ExA** sought clarification that with Units 5 and 6 shutting down, the water cooling system from these can apply to the two proposed BECCS units, but that any further BECCS units would require further cooling infrastructure. **Jim Doyle** confirmed this to be the case.

2.4.16. **Sara Robin** queried the temperatures of the flue gas throughout the process. The Applicant addressed this query later in Issue Specific Hearing 1 – see paragraph 2.8.1 below.

2.4.17. **Katy Brown** asked if the expected efficiency gains from BECCS could be quantified. **Chris Summers** responded that the efficiency across the Plant is related to the heat transfers through the system, reducing maintenance and running the cooling water pumps more efficiently as a result of this. It is therefore difficult for the Applicant to

quantify the efficiency, as the carbon capture process is thermal-orientated. **Richard Griffiths** noted that the Applicant is not relying on these indirect benefits to the Plant as a whole as a benefit of the Scheme in the context of the planning balance. These were only referred to by the Applicant in the Explanatory Memorandum to explain the role played by Work Nos. 1A and 1B, alongside referencing the additional benefit on the existing system, for the sake of completeness.

OVERALL CHANGE IN GREENHOUSE GAS ("GHG") EMISSIONS FROM THE PLANT

2.4.18. **The ExA** asked the Applicant to provide a brief explanation of the overall change in GHG emissions from the Plant.

2.4.19. **James Peet** noted that the assessment of GHG emissions has been undertaken in line with internationally recognised carbon accountancy best practice, relevant guidance and UK legislation. The relevant GHG values are presented in the GHG chapter and appendices of the Environmental Statement [APP-051, APP-168 and APP-169]], with further details of the scope and calculation methods used also available in this chapter.

2.4.20. **James Peet** ran through a calculation of the baseline emissions, as follows:

1. As there is no construction proposed on site, the construction emissions are 0 tCO2e.

2. Assuming that two units run at mid-merit, including operational energy use, land use change at the Plant (which includes areas currently vegetated) and emissions from the biomass supply chain, the operational emissions are calculated at 547,915 tCO2e/yr. This is based on an assessment that has been third-party verified.

3. Therefore, the whole life emissions over the 25-year project design life are calculated as 13,697,815 tCO2e. These emissions come from the biomass supply chain and relate to non-CO2e emissions from biomass combustion.

2.4.21. **James Peet** then provided a calculation of the figures once the emissions from the Scheme are included:

1. Construction emissions are 104,700 tCO2e, based on the production of raw materials, transport to the site, plant activity on the site and removal of waste. The information for this comes from the Applicant's design team, combined with the rate of carbon associated with materials and information from RICS, which has allowed for a calculation of emission for transportation and Plant use.

2. Operational emissions are minus 7,975,620 tCO2e/yr. This negative figure includes emissions from the biomass supply chain, the same methods as within the baseline analysis, replacement refurbishment, emissions from the production of solvent used during operation and the carbon capture itself.

3. The whole life emissions over the 25-year project design life are therefore minus 199,302,775 tCO2e. Again, these emissions come from the biomass

supply chain and relate to non-CO2e emissions from biomass combustion and are based on two units running at full capacity.

2.4.22. **James Peet** noted that the net impact of the Scheme over 25 years, including construction and operation, is therefore minus 213,000,650 tCO2e.

2.4.23. **The ExA** noted that the supply chain is inclusive of everything across the Plant and queried how it is possible to calculate what is applicable to just Units 1 and 2. **James Peet** responded that the numbers used represent the quantity of CO2 per Mwe; therefore, given that the Mwe values are known for Units 1 and 2, proportional calculations can be made to understand the figures for these units alone.

2.4.24. **The ExA** asked if the negative emissions figures calculated above are representative of the whole Plant, or solely Units 1 and 2. **James Peet** confirmed that it was the latter. **Richard Griffiths** noted that Units 3 and 4 are not part of the application – these units are currently running under a subsidy regime and are ending in 2027, but nothing changes in planning terms with regard to these units due to them not forming part of the application.

2.4.25. **Richard Griffiths** clarified that Units 1 and 2 will, with BECCS, be carbon negative. **The ExA** noted that the Planning Statement refers to the Plant as a whole being the UK's first carbon negative plant. **Michael Goldsworthy** stated that the negative emissions delivered for Units 1 and 2 will be far in excess of anything across the Plant, meaning that this statement does apply to the Plant as a whole. **James Peet** clarified that the calculations were performed on the basis of BECCS being installed on both Units 1 and 2. **Richard Griffiths** confirmed that the Applicant could justify the carbon negative statement and would provide a paper on this point at Deadline 1. This is presented in **Appendix 1** to this document.

2.4.26. **The ExA** sought an explanation of the Applicant's carbon neutral phrasing. **Richard Griffiths** responded that the biomass chain is included in the GHG assessment. The Applicant's position is that biomass is zero rated, not that it is carbon neutral. **James Peet** added that, per the guidance referenced below, biomass is rated as zero from a carbon perspective.

2.4.27. **James Peet** quoted guidance from the IPPC (2006), the GHG protocol and the UK Environmental Reporting Guidelines. All of the relevant guidance for quantifying emissions of GHG emissions from biogenic sources, such as biomass, rate emissions as zero. **James Peet** also referenced the independent Climate Change Committee's balanced pathway to net zero, the UK Government's Industrial Decarbonisation Strategy and BEIS' Biomass Policy Statement (the **"Policy Statement**"), noting that the reason carbon accountancy practice and policy rates CO2 emissions from biomass as zero is because (unlike fossil sources) the emissions are considered short cycle. This is because as the biomass grows, CO2 is removed from the atmosphere, and when this biomass is combusted, this CO2 returns to the atmosphere. Therefore, there is no net change in CO2 in the atmosphere due to the combustion of the biomass.

2.4.28. **The ExA** requested extracts of the above guidance to be submitted into examination at Deadline 1. This is provided in the annexes to **Appendix 1** to this note.

2.4.29. **Post-Hearing Statement:** Appendix 1 deals with Action Points 1,2 and 4 noted in the ExA's Action Points discussed at the Hearing and confirmed in [EV-018].

2.4.30. **The ExA** noted that the Policy Statement suggested that the full supply chain must be included within a GHG assessment, including from the 'eventual store' and queried if these figures are available.

2.4.31. **Matthew Fox** noted that it is important to set that statement in the Policy Statement in the context of the Government's wider position on biomass set out in the Policy Statement and that the 'assessment' referred to is not one to be undertaken by project applicants, but by the Government itself. **The ExA** requested that the Applicant provide a short statement, addressing these matters on the Policy Statement, at Deadline 1. **Richard Griffiths** confirmed that the Applicant would provide this, but also noted that the Applicant is not seeking consent for anything that would create a new supply chain.

2.4.32. **Post-Hearing Statement on this point and dealing with Action Point 3***:*

2.4.33. The Applicant considers that the Biomass Policy Statement does not require project Applicants to undertake an assessment of the full BECCS lifecycle when the relevant part of the Policy Statement is read as a whole. The relevant text (from pages 35-36 of the Policy Statement) are extracted below, and the Applicant considers it is clear that this 'whole-life' assessment is something that Government is considering undertaking in developing its BECCS policy; and that it will be working with the relevant parties to do this.

"When undertaken sustainably, BECCS can deliver negative emissions because carbon sequestered in biogenic material is captured and stored after combustion, resulting in a net decrease in atmospheric CO2 overall. Some organisations including trade associations, university researchers and NGOs raised concerns over the net negativity of BECCS in the biomass call for evidence and asked how the Government might support BECCS to deliver negative emissions. To ensure that BECCS delivers genuine negative emissions, strict biomass sustainability criteria will be developed for BECCS. These criteria will build on the existing sustainability criteria for biomass that are being reviewed as part of the Biomass Strategy. Research and updated regulation will also be required to understand and address any air quality impacts from BECCS, including emissions associated with carbon capture solvents.

The Government is clear that any BECCS deployment must be genuinely and credibly 'net negative', meaning it must remove more GHG emissions from the atmosphere than it creates, and store them in long-term geological storage. This assessment would include all GHGs (including methane and nitrous oxide) from the whole BECCS supply chain, including carbon capture at the capture plant and eventual store. For this reason, the Government convened a GGR Monitoring, Reporting and Verification (MRV) Task and Finish Group with the aim of

understanding the current position on MRV for negative emissions in the UK, what regulatory frameworks and standards currently exist, identifying the gaps that exist, and the work required to fill them.

The Group identified a need for HMG to develop detailed MRV protocols for all non-geological sequestration GGR approaches (e.g. biochar, or enhanced weathering), and by 2024 establish an independent function to sit between project developers and HMG. Alongside this, we will develop a BECCS policy that will ensure that BECCS delivers genuine negative emissions, in parallel with the review of our existing sustainability criteria".

2.4.34. **Further Post-Hearing Note***:* The Applicant notes that even if the T+S infrastructure were to be included, it would have limited impact on the assessment, because based on calculations from the East Coast Cluster/NEP, set out in the HLCP PEIR, 2g of CO2e, there would be generated for every kg CO2 transported and stored for the Humber elements.

2.4.35. **James Hewitt** noted that the electricity system is required to be decarbonised by 2035, which implies that the Plant will be operating intermittently, with inefficiencies arising in carbon capture.

2.4.36. **Richard Griffiths** noted that in terms of the operating scenarios post-2027, the likely scenarios considered by the Applicant have been provided in the application documents. In relation to the emissions, **James Peet** stated that the Institute of Environmental Management and Assessment Guidance for assessing GHGs and their significance in the context of Environmental Impact Assessments clarifies that schemes should be assessed on the basis of impact with and without any said scheme. Therefore, regardless of where the Applicant sources its wood for the Scheme, the impact from emissions is negative. **Michael Goldsworthy** also referenced the Intergovernmental Panel on Climate Change ("**IPCC**") Guidelines, Chapter 2, section 2.3.4, which supports this position. This is referenced and extracted in **Appendix 1** to this document.

2.4.37. **Stuart Boothman** queried what was included in the calculation of supply chain emissions and what is considered in the scope. **James Peet** responded that the whole value chain is included, from the process at origin through to the transport to the Plant. **James Peet** noted that the Applicant followed the above-mentioned guidance to state that biomass equates to zero emissions, with climate change being driven by the net change in emissions. Commercial forestry concerns the combustion of biomass and the regrowing cycle, meaning that there is no net change. **Stuart Boothman** referenced an alternative academic paper on this topic, the summary of which is that the carbon payback period from a clear-felled forest is somewhere in the decades to centuries, meaning that the carbon recapture repayment period would be well beyond the net zero target date and therefore there is a carbon debt for wood-felled biomass. Even if the forest is completely replanted, the forest will never fully recapture the entirety of the carbon from the initial clearing due to the carbon density. **The ExA** requested that this additional academic paper be provided at Deadline 1.

2.4.38. **Richard Griffiths** stated that the supply chain is already in existence, with the Applicant not requesting consent for a new biomass generating station. EN-1 and EN-3 note that other regimes govern the sustainability of biomass. **Richard Griffiths** noted that the Applicant would provide a response to Mr Boothman's point once this documentation is submitted by Mr Boothman, but stated that Government policy (of which there is a raft from 2018-2022 that states BECCS plays an important role in reaching carbon targets) should not be debated and that the Applicant's assessment had been undertaken in line with the relevant guidance.

EFFECT OF THE SCHEME ON THE OUTPUT CAPACITY OF THE PLANT

2.4.39. **The ExA** queried whether, in relation to the works to upgrade and modify the existing Plant, these do not increase the potential output capacity of the Plant, which **Jim Doyle** confirmed to be correct.

2.4.40. **The ExA** noted that the output capacity to the National Grid will drop from 645Mwe to 450-480Mwe and queried whether this will be subject to an energy penalty (which was echoed by **James Hewitt**). **Richard Griffiths** noted that it is important to clarify that the output from each of Units 1 and 2 remains the same and that it is only due to BECCS having its own parasitic energy requirement that the exported value to the National Grid decreases. **Chris Summers** stated that the BECCS process requires steam for the chemical reaction to be reversed, with the steam taken from the host biomass unit, passed through the combined turbine and used to generate power for the process. In addition, the electricity consumed across BECCS requires additional energy. Therefore, the reduction in output to the National Grid is made up of the steam and electricity consumption. **The ExA** asked if this would be attributed to Work No. 1C, which **Chris Summers** confirmed.

2.4.41. **The ExA** queried if there was any energy penalty from the Applicant to contribute to the transportation of the CO2 through the pipeline. **Chris Summers** responded that part of the works power load from the host unit is for the compression of CO2 to the pipeline specification for transportation, meaning that the energy load penalty discussed above includes the compression electrical load. **The ExA** sought clarification that there is compression, but not contribution of power to the associated pipelines, which **Chris Summers** confirmed (a flow down to the requirements of the pipeline).

2.4.42. **The ExA** referenced **James Hewitt's** concern of a shortfall of energy; namely, where this would lead to fossil fuel generation elsewhere. **Richard Griffiths** confirmed that there is no evidence to suggest that this is a likely scenario – every modelled scenario (including by the Committee on Climate Change) on how the UK can reach net zero includes BECCS. With each BECCS plant requiring power, the modelling has considered this need for power and yet net zero is obtained in each scenario, meaning BECCS is carbon negative. If BECCS is not consented, the likely scenario would become that Units 1-4 operate at 4,000 hours per unit, which is a greater deficit to the National Grid than having Units 1 and 2 operate with BECCS.

2.4.43. **Katy Brown** noted that Biofuelwatch do not accept that biomass is renewable, but accepted that the framework does consider this to be the case, and stated that the energy penalty and the reduction in the output to the National Grid would be incompatible with EN-1. **Richard Griffiths** repeated the Applicant's submission above that there would be a greater deficiency to the National Grid in the absence of BECCS and that that scenario would be incompatible with the NPS.

EFFECTIVENESS AND RELIABILITY OF THE PROPOSED TECHNOLOGY FOR THE CAPTURE OF CO2

2.4.44. **Steven Foster** provided an initial update on this topic, stating that the Applicant recognised that the technology selection needed to consider commercial, technical, and environmental performance. These factors are key to the long-term effectiveness, reliability credibility and viability of post-combustion carbon capture in terms of supporting the net zero agenda and for BECCS negative emission technology.

2.4.45. The Applicant undertook a thorough review of the available technologies and solvents, considering single solvent options, cutting-edge proprietary solvent blends through to cutting edge developing technologies. This review considered the maturity of the systems and associated real world operation, the related energy demand to capture a kg of CO2, the lifecycle of the solvent and the environmental impact of the operation. While considering operational factors such as maintenance and reliability, the Applicant also opened up the Plant and access to the flue gases to several technologies, utilising a range of alternative capture approaches from amine and non-amine solvent to cutting-edge nano engineered filtration.

2.4.46. The review identified that proprietary solvents offered significant benefit over the mature single solvent option of monoethanolamine. The review showed significant benefits in terms of volatility, thermal degradation and oxidative rates compared to other reviewed solvents, which are all key aspects in mitigating the formation and release of reaction by-product and vapour release.

2.4.47. The process also considered total thermal heat demand, electrical output penalty, water demand, solvent consumption and efficiency. The Applicant's pre-FEED assessments selected the MHI KM-CDR process, utilising their latest solvent technology in KS21. The process saw significant life cycle and solvent pairing benefits from a resource efficiency, capture efficiency and emission perspective. This is because of the way that both the solvent and the associated capture plant have been developed over several decades in tandem. This has resulted in the Applicant's view that the inclusion of key innovations result in improved capture efficiency and reliability through elements such as improve heat management, solvent recovery and reclamation and capture efficiency of the solvent itself. To support this, the Applicant is looking to integrate this with the current Plant to maximise the operational efficiencies and reliability that this supports. For example, the utilisation of the existing natural draft water based cooling offers more effective and efficient cooling than all other forms of cooling available for an inland station.

2.4.48. The Applicant was always of the view that the capture efficiency would form a critical component of any environmental permit application. This was affirmed with publication of the Best Available Techniques guidance for post-combustion carbon capture technologies by the Environment Agency[1]. This specifically requires that the plant should achieve around 95% CO2 capture efficiency. To that regard, the Applicant needs to be confident that the technology that was selected could achieve this requirement and the associated scrutiny that will be applied during the assessment and determination of the environmental permit.

2.4.49. **The ExA** queried whether this permit was from the EA, which **Steven Foster** confirmed. **Chris Gaughan** confirmed that the minimum standard of 95% must be met, with ongoing discussions currently taking place between the EA, BEIS and the Department for Environment, Food & Rural Affairs on what this 95% means in reality – i.e. what emissions are included. **The ExA** asked how the 95% is monitored and the temporal nature of the commitment, with **Chris Gaughan** again noting that this is subject to technical discussions regarding the monitoring of a dense stream of CO2 with a high concentration.

2.4.50. **The ExA** queried whether, if the Scheme was to gain consent, the 95% requirement would be regulated through an environmental permit. **Richard Griffiths** confirmed that the Scheme cannot operate without an environmental permit, which will indeed contain a condition of compliance with and monitoring of the 95% requirement. **Chris Summers** noted that the current understanding is that this will be a requirement of 95% annual capture rate.

2.4.51. **The ExA** sought examples from the Applicant of any carbon capture and storage ("**CCS**") projects that use similar technology to that proposed for BECCS and which achieve 95% efficiency. **Richard Griffiths** referred to the Applicant's Responses to Relevant Representations and Additional Submissions [PDA-002], page 82, in which the Applicant refers to 35 large-scale CCS projects operating globally, alongside page 87 of the same document which lists worldwide projects. The Applicant, through its pilot programme, was the first company in the world to demonstrate carbon capture from biomass. **The ExA** asked if the 35 projects referred to had met the 95% requirement. **Steven Foster** could not comment on this, but noted that underpinning research undertaken by the EA for its BAT post-combustion carbon capture guidance was based on further research done for them which confirmed that best available technology would be able to meet the 95% requirement. The Applicant looked at the global position and the technology involved on this.

2.4.52. **James Hewitt** queried whether the CCS projects referred to above were typically for enhanced oil recovery, with concentrated streams of effluent gas in any event, and noted that woody biomass has different characteristics in post-combustion and that the Scheme would be the first project of this nature, leading to the query as to the

[1] This is available online only here: https://www.gov.uk/guidance/post-combustion-carbon-dioxide-capture-best-available-techniques-bat

actual amount of carbon capture that the Scheme will achieve in reality. **Steven Foster** responded that the 'new' element of the Scheme is the use of the flue gas stream, rather than the carbon capture technology itself. Biomass flue gas has several benefits in relation to carbon capture, with the purpose of the Applicant's pilot programme being to prove that flue gas would work as a capture mechanism. Whilst the amount of capture was small, the trial provided enough evidence to prove the successful effect of the flue gas in contact with the solvent. **Richard Griffiths** noted that, after the trial, the next logical step is to apply for the Scheme on a commercial scale, and noted again that the environmental permit (containing the 95% requirement) is required for the Scheme in any event. It is therefore in the interests of the Applicant to ensure that penalties are avoided under the Business Model, by making the Plant as efficient as possible.

2.4.53. **Katy Brown** noted that the longest-running carbon capture facility is the Canadian project at Boundary Dam, but this only captured 37% of its target carbon in 2021, though noting that this was not a BECCS project. It was suggested that the technology is not yet working at the scale to which the Scheme requires. **Luke Varley** responded that the chemical reaction pilot programme and the basic design for the Scheme takes into account the 95% requirement, and demonstrated that the two aspects of the Scheme for which the 95% requirement is being worked towards could work.

2.4.54. **The ExA** referenced the Keadby 3 project, which contained a requirement that stated that there was to be no development until the environmental permit had been granted. **Richard Griffiths** distinguished between the two projects – Keadby 3 being a new generating station with carbon being emitted, whilst the Scheme is not a new generating station and therefore the reasoning is different. In relation to the transport network consenting requirement of Keadby 3, this does not accord to policy in relation to the Scheme which has BECCS as a key part of all scenarios of reaching Net Zero, and therefore should not be delayed.

2.4.55. **The ExA** queried what would happen if work started on the Scheme, but then the environmental permit is not granted. **Richard Griffiths** went on to comment that the Applicant would make a written submission on the point alongside submitting its updated DCO at Deadline 2 (as suggested in the Preliminary Meeting yesterday).

SCOPE OF DEVELOPMENT TO CONSTRUCT ONE OR BOTH UNITS – CIRCUMSTANCES

2.4.56. **The ExA** sought an explanation of the circumstances that will determine the scope of development to construct one or both units of the Scheme. **Richard Bass** confirmed that the Applicant's intention is to construct both units together. This is subject to a commercial agreement with BEIS for a support mechanism – ideally this will be provided for both units, but should BEIS decide that only one unit will be funded then the Applicant will proceed accordingly. In addition, the 5th and 6th Carbon Budgets, along with the net zero target, are benefitted by developing both units.

2.4.57. **The ExA** queried whether if only one unit was constructed, would the remaining unit continue to operate as per Units 3 and 4. **Richard Griffiths** confirmed that should only one unit have BECCS applied to it, the remaining three units will operate in the mid-merit scenario of approximately 4,000 hours per unit per year.

2.4.58. **The ExA** asked if the scope of Work Nos. 1A and 1B would change if only one unit has BECCS applied to it, rather than both. **Chris Summers** noted that the same works would be done for the single unit, as there are additional benefits across the Plant. There would be a proportionate change, but there are benefits from upgrading even one unit. **The ExA** sought clarity as to whether the non-BECCS unit would obtain any benefit from the works in this scenario, which **Chris Summers** confirmed by noting that all four units would see an additional benefit from the upgrade to infrastructure. **Richard Griffiths** noted that the benefits set out in the Explanatory Memorandum apply to the Plant as a whole.

2.4.59. **Richard Bass** stated that the Scheme is to be set up and financed through the Business Model, which allows the Applicant to raise funds whilst incentivising BECCS plants to operate their baseload and maximise generation of negative emissions.

OPERATION AND LOAD PROFILE OF BECCS AND NON-BECCS GENERATING UNITS

2.4.60. **The ExA** noted paragraph 6.9.16 of Chapter 6 of the Environmental Statement states that it is likely that the BECCS units would be brought into operation more frequently than the non-BECCS units, and queried the measures that would be put in place to control that. **Richard Griffiths** noted that this is governed under a commercial contract, with the operating mode linked to this in terms of the baseload that **Richard Bass** referred to above. The applicant's assessment is that the BECCS units will operate baseload, i.e. 8,760 hours, which equates to operating 365 days of the year at full load. The ExA quired whether bringing the BECCS units, as opposed to the non-BECCS units, into operation is something that is controlled by the Applicant. **Richard Bass** responded that the Applicant will operate in response to the commercial contracts it enters into with the Government.

2.5. AGENDA ITEM 4 – THE NEED FOR THE PROPOSED DEVELOPMENT

NEED FOR THE SCHEME IN THE CONTEXT OF THE NEEDS AND BENEFITS STATEMENT AND EMERGING GOVERNMENT POLICIES

2.5.1. **The ExA** asked the Applicant for an explanation of the need for the Scheme in the context of the Needs and Benefits Statement and emerging Government policies.

2.5.2. **Richard Griffiths** began by stating that the Applicant's position on compliance with the adopted and draft National Policy Statements ("**NPSs**") is set out in the Planning Statement [APP-032]. The two adopted NPSs of relevance to the Scheme are NPS EN-1, which is the Overarching NPS for Energy, and NPS EN-3, which is the Renewable Energy Infrastructure NPS.

2.5.3. In terms of general principles, Part 2 of NPS EN-1 outlines the policy context for the development of nationally significant energy infrastructure, reflecting the Government's commitment to meeting key goals relating to carbon emission

reductions, energy security and affordability. Paragraph 2.2.6 of EN-1 states that under some 2050 pathways, electricity generation would need to be virtually emission-free, whilst paragraph 2.2.7 states that global emissions must start falling as a matter of urgency. The Scheme accords to this Government policy on energy infrastructure, and its consenting and subsequent operation will assist the Government in meeting its legally binding net zero commitment.

2.5.4. Part 3 of EN-1 identifies the role that different types of energy infrastructure can play in meeting its policy position set out in Part 2. The Scheme is an extension to an existing biomass generating station, which Part 3 of EN-1 confirms at paragraph 3.4.3 is a significant source of renewable and low carbon energy and its need is confirmed as urgent.

2.5.5. Paragraphs 3.6.4 to 3.6.7 of EN-1 explain the role CCS can have in meeting emissions targets whilst maintaining security of supply, as CCS has the potential to reduce carbon emissions by 90% as at the date of the NPS, though this is going to be 95% for the Scheme, as discussed above.

2.5.6. Part 4 of EN-1 at section 4.7 discusses the role that CCS can play and identifies three types of technology, of which post-combustion capture, being the technology of BECCS, is one of them. EN-1 refers to carbon capture technologies being able to remove up to 90% of the CO2 that would otherwise be emitted, which reflects the position at the time EN-1 was adopted. The Scheme will be designed to capture approximately 95% of the CO2 from Units 1 and 2, thereby exceeding the assumed figures in EN-1. The Scheme therefore accords and exceeds the Government's policy position on CCS technology in Part 4 of EN-1.

2.5.7. Therefore, as a matter of principle, the BECCS Project is in compliance with the energy policies set out in EN-1 given it will play an important role in meeting legally binding commitments to reduce emissions whilst its host generating station, which is identified as being urgently needed, will maintain security of supply.

2.5.8. In terms of NPS EN-3, Part 2.5 sets out the policies relevant to biomass combustion. Whilst this application is not for a biomass generating station, BECCS is an extension to a Biomass generating station. Whilst Part 2.5 only refers to Carbon Capture Readiness ("**CCR**"), BECCS is the next step post-CCR, being the actual implementation of carbon capture infrastructure. It can therefore be taken that BECCS is in compliance with EN-3.

2.5.9. The Application must be decided in accordance with the adopted NPSs, EN-1 and EN-3, and as outlined BECCS is supported in both those NPSs. However, the emerging NPSs are important and relevant considerations by the Secretary of State ("**SoS**"). Draft EN-1 and Draft EN-3 contain stronger policies in support of BECCS.

2.5.10. Paragraph 3.5.1 of draft EN-1 states that new CCS infrastructure "*will be needed*" to ensure the transition to a net zero economy. Furthermore, paragraph 3.5.1 quotes the Committee on Climate Change from its 2019 Report that CCS is a necessity, not an

option. Paragraph 3.5.1 identifies the areas where CCS infrastructure will be needed, with BECCS being identified as one of them.

2.5.11. Paragraph 3.5.3 goes on to state that there do not appear to be any realistic alternatives to new CCS infrastructure for delivering net zero by 2050. Paragraph 3.5.7 confirms that as some sectors will be difficult to decarbonise, such as aviation and agriculture, there will be a need for negative emissions. Capturing and storing emissions from bioenergy provides a source of negative emissions. Therefore, paragraphs 3.5.1 to 3.5.7 of draft EN-1 sets out the need for CCS. **Richard Griffiths** therefore concluded that the principle of BECCS is in compliance with both the adopted and the emerging NPSs.

2.5.12. **The ExA** noted that the Application is not for an energy infrastructure scheme and thus queried if section 104 of the Planning Act 2008 should apply to this Scheme. **Richard Griffiths** responded that the Application is for an extension to an existing generating station, therefore falling within s.14 of the Planning Act 2008, meaning it falls within the remit of EN-1. The Scheme is a Nationally Significant Infrastructure Project due to it being an extension to an existing generating station and therefore falls within the remit of s.104 of the Planning Act 2008.

2.5.13. **The ExA** requested that the Applicant provide a note at Deadline 1 to consider whether section 104 or 105 of the Planning Act 2008 apply in respect of the Scheme; and to confirm the applicant's case under each section in any event. **This is provided at Appendix 2 to this document, thus fulfilling Action Point 7.**

2.5.14. **Richard Griffiths** then continued the explanation by noting that aside from the adopted NPSs and the draft NPSs, which are the primary policy documents establishing the need for BECCS under the Planning Act 2008, the Government's commitment to carbon capture technologies and BECCS is also established in various other policy documents.

2.5.15. The IPCC in its "Climate Change 2022" Report, states that without immediate and deep emissions reductions across all sectors, limiting global warming to 1.5 degrees is "beyond reach". In its report, the IPCC highlighted that BECCS is an important tool to achieve climate change mitigation and that it is an integral part of all widely accepted pathways to keeping the global temperature rise to 1.5 degrees.

2.5.16. This is confirmed in the most recent independent review commissioned by the Government which was published on Friday 13 January 2023: "Mission Zero – Independent Review of Net Zero" by the Rt Hon Chris Skidmore MP (the "**Review**"). At paragraph 347, the Review states that biomass plays an important role in the net zero transition – "*as an input for deployment of bioenergy with CCS it could also generate negative emissions in the future*." The Review refers to the Net Zero Strategy ("**NZS**") and its scenarios, which shows that BECSS provides the largest single source of negative emissions required to offset residual emissions in 2050 (various Whole System Energy models reviewed (UK TIMES, ESME, CCS modelling) show the need for BECCS technologies to deliver well over half (and often close to

70%) of negative emissions from engineered GHG removals, as well as at least a third of all sequestered emissions (including nature-based removals)).

2.5.17. Section 2.7 of the Review is titled “Reducing emissions through carbon capture and removal.” One of the Review’s recommendations is that the country must act quickly to foster certainty and attract investment. Paragraph 393 of the Review confirms that all modelled pathways to net zero envisage a key role for CCS and quotes the Climate Change Committee’s description of CCS as being “*a necessity, not an option*”, mirroring draft EN-1. Paragraph 426 of the Review confirms that BECCS is a key engineered GHG removal method, and that the process will also help create net zero aligned jobs and unlock export opportunities.

2.5.18. In essence, the Review confirms CCS and BECCS’ importance in reaching net zero and is advising the Government that it must work rapidly to implement CCS, and enable enhanced cluster to progress quickly.

2.5.19. **Richard Griffiths** then turned back to Government policies, which are set out below. This summarises the content of the Needs and Benefits Statement [APP-033], which provides the full picture of the Applicant’s position on this matter.

2.5.20. November 2018: Clean Growth: The UK Carbon Capture Usage and Storage deployment pathway: An Action Plan – the Action Plan refers to the Committee on Climate Change’s advice in 2016 following the Paris Agreement, that GHG removal technologies will be required alongside widespread decarbonisation in order to reach net zero emissions. It also refers to the Committee on Climate Change’s report on bioenergy, which suggests that producing negative emissions could be the most valuable use of biomass by 2050. Indeed, the CCC’s report concluded that if BECCS could be scaled up to remove between 20 and 65mt of CO2 p.a., then that would represent between 5 and 15% of the UK’s GHG emissions. The Action Plan identifies that BECCS is one of the most scalable GHG technologies and links back to the October 2017 Clean Growth Strategy, which recognises, in line with independent advice from the Committee on Climate Change, that GHG removal technologies are likely to have an important role to play in offsetting difficult to cut emissions. The Action Plan refers to the Royal Society and the Royal Academy of Engineering which concluded that around 130Mt of carbon p.a. would need to need to be accounted for by net zero emissions. This clearly shows a need for the Scheme.

2.5.21. November 2020: Ten Point Plan for a green industrial revolution – Point 8 of the Plan is about investing in CCS. The Plan states that developing CCS infrastructure will contribute to the economic transformation of the UK’s industrial regions by supporting 50,000 jobs in the UK by 2030. The Scheme will support the East Coast Cluster, investment in the region and jobs.

2.5.22. December 2020: Energy White Paper: Powering our Net Zero Future – the White Paper confirms that BECCS plants could deliver negative emissions, by capturing the carbon released during biomass combustion, provided the supply chain emissions are sufficiently low. The White Paper has an ambition to capture 10Mt of CO2 per year by 2030. The White Paper also confirms the Government’s proposals to decarbonise in

clusters and outlines the East Coast Cluster of which the Scheme forms part. The clusters will all act as an economic hub for green jobs. The White Paper clearly supports the need for the Scheme.

2.5.23. October 2021: NZS: Build Back Greener – in terms of what has happened to date, bioenergy has already played a significant part in decarbonising the electricity system, accounting for 12.6% of total renewables generation in 2019. The NZS also notes that the pathways to net zero includes CCS and, notably, BECCS. This is due to technological advances, which mean that biomass usage can now go beyond carbon neutral and deliver negative emissions by combining it with BECCS. In addition, the NZS notes that BECCS can help offset those sectors that are more difficult to decarbonise such as aviation and farming practices. Under the heading of net zero transition and opportunities, point 11 of the NZS states that by 2030, the Government envisages significant deployment of mature BECCS technologies, including retrofit applications in the power sector, which could be deployed by late 2020s. Lastly, the NZS outlines a Government ambition of capturing 20-30Mt of CO2 by 2030. In the space of a year, the Government has increased its ambition from 10Mt to 20-30Mt p.a. by 2030, thereby strengthening the need for the Scheme. The NZS therefore supports the deployment of BECCS and the Scheme.

2.5.24. November 2021: the Policy Statement – this outlines the Government's rationale for BEECS. Section 2.7 states that Government and the CCC modelling have both found that GHG removal technologies will be required to offset residual emissions in sectors that are difficult to decarbonise, such as aviation and agriculture. The Statement continues that if deployed early, then GHG removal technologies could provide an opportunity to help meet the Government's 2030 Nationally Determined Contribution to reduce GHG emissions by 68% on 1990 levels, as well as help meet the 5th and 6th Carbon Budgets. In terms of power BECCS, the Statement notes that based on available evidence, power BECCS could be a major GHG removal technology in the period to 2050, due to opportunities to retrofit existing large-scale biomass plants. It goes on to say that power BECCS is expected to deliver a steady increase of removals in the late 2020s and 2030s, which is supported by the CCC and the National Infrastructure Commission. Indeed, the CCC scenarios have up to 39mT p.a. of GHG removals from power BECCS by 2050.

2.5.25. April 2022: British Energy Security Strategy – as part of a ten point plan, the Government outlines that it will invest in CCS technology and announced the first 2 clusters in the North East, of which BECCS forms part. This Strategy also reaffirms the ambition to achieve 20-30Mt of carbon capture p.a. by 2030. The Scheme will significantly assist in this ambition, by removing at least 8Mt of CO2 from the atmosphere p.a., which is at least 40% of the 20Mt target.

2.5.26. **Richard Griffiths** then noted that in terms of emerging policy, the Government intends to publish a Biomass Strategy. This is likely to only strengthen the already strong policy support for the Scheme. Indeed, the Review urges the Government to publish this strategy as soon as possible in order to provide confidence and certainty

so that investment in GHG removal technologies, such as BECCS, can move forward quickly. In addition, the Government is developing business models for industrial and power CCS.

2.5.27. **Richard Griffiths** concluded that to achieve net zero by 2050, Government Policy and emerging Government Policy, which has taken into account and had regard to independent bodies such as the Committee on Climate Change, the IPCC, the Royal Society and the Royal Academy of Engineering, establishes a need for GHG removal technology. In particular, the policies recognise the role that BECCS can play – providing dispatchable renewable power and negative emissions – and that retrofitting BECCS to existing biomass generating stations will significantly assist in achieving not only the 2050 target but the 20-30Mt 2030 target.

2.5.28. **Richard Griffiths** noted that BECCS at the Plant complies with all of these policies. Being a retrofit solution, it can be deployed quickly and before 2030, thus helping meet the 2030 ambitions and also the 6th Carbon Budget to cut emissions by 78% by 2035. As set out in the Needs and Benefits Statement, not deploying BECCS at the Plant in 2027 would cost the UK an additional £13bn and make achieving the 6th Carbon Budget significantly harder. The Scheme can also act as an anchor project for development of the CO2 Transmission and Storage infrastructure as part of the Humber CCS Cluster.

2.5.29. **Matt Stocks** followed that the Scheme will accelerate clean growth, protect British industries across the Humber, create thousands of new green jobs across the UK, and make Britain a global leader in developing climate-saving technologies. It is clear that responding to this global challenge, whilst requiring investment and innovation, presents opportunities for growth and job creation.

2.5.30. **Matt Stocks** noted that the Applicant is also part of the Coalition for Negative Emissions, a multinational collection of organisations from a diverse range of industries with a shared ambition: to create a sustainable economy while helping protect the environment. A report published in 2021 estimates that between 50,000 and 100,000 total new jobs could be created in the UK by 2050 by scaling up negative emissions projects. At the local level, it is estimated that the Scheme could generate annual average construction employment of 4,000 direct, 1,600 indirect and 2,500 induced jobs (Vivid Economics Limited, 2021). Once the BECCS units are operational, up to 375 Full Time Equivalent ('**FTE'**) employees will be employed at the Plant (a combination of retained and new jobs), and a total of 960 indirect and 1,800 induced FTE jobs will be created. At the regional level (the Humber Industrial Cluster), the Scheme could create an estimated 47,800 operational direct, indirect and induced FTE jobs (Vivid Economics Limited, 2021). With BECCS being an emerging and scalable technology within a growing renewables and CCS section, this is a skills transition offering long-term viability of jobs supported by the Government (HM Government, 2021).

APPLICABILITY OF THE NZS IN ASSESSING THE NEED FOR THE SCHEME

2.5.31. **The ExA** asked for an explanation of the applicability of the NZS in assessing the need for the Scheme.

2.5.32. **Richard Griffiths** noted that the NZS was judicially reviewed in 2022. Whilst the Court upheld the challenge, it did not quash the NZS, which therefore remains in place. The Court ordered the Government to publish an updated climate report by the end of March 2023, setting out further detail on how its net zero goal will be achieved. Therefore, the challenge was successful on the basis that the Court found that, in his ministerial briefing, the SoS had not been informed of: (i) the quantitative effects of individual policies on the net zero goal; nor (ii) in the qualitative analysis, which policies were relied upon to make up the 5% shortfall and in what ways (given that the NZS would achieve only 95% of the required emissions reductions, leaving a 5% shortfall). The SoS is legally obliged to take those considerations into account in assessing the NZS and, as he was not provided with the relevant information, he had failed to discharge his duty. The Court did not comment on, nor would it have been appropriate to, on the policies themselves, simply that there was no analysis as to how they would achieve the reduction.

2.5.33. In its decision on the A417 Missing Link DCO, the SoS acknowledged that there had been a successful challenge to the NZS. The SoS confirmed that the NZS remained Government policy, as it had not been quashed, and went on to consider whether the proposal would hinder delivery of the NZS. It was against that background that the SoS considered the application. Therefore, **Richard Griffiths** noted that the **ExA** should consider whether the Scheme would hinder the Government's ability to meet net zero.

2.5.34. Therefore, **Richard Griffiths** stated that the NZS remains applicable as it remains Government Policy. It can, and should, be an important and relevant consideration against which the SoS must assess whether the proposal would hinder its delivery. It is the Applicant's case that the Scheme would in fact do the opposite – it would help enable its delivery.

2.5.35. **The ExA** asked if there had been any change in the Applicant's position set out in paragraph 3.3.4 of the Needs and Benefits Statement. **Chris Summers** noted that the Applicant's intention was to cease operation of Units 5 and 6 in 2021, but that the Applicant was approached by National Grid to extend this – however, decommissioning of these units will occur in 2023. **The ExA** queried whether this must happen in order for the Scheme to run as advertised, which **Chris Summers** confirmed to be the case. **Richard Griffiths** added that this is the reason for Units 5 and 6 not running in the baseline methodology.

2.5.36. **The ExA** noted concerns for the predictability of external biomass supply, referencing paragraph 4.2.41 of the Needs and Benefits Statement, and queried whether there would be sufficient sustainable biomass for the lifetime of the Scheme. **Richard Bass** responded that the Applicant has no concerns on the issue of supply of sustainable biomass for the Scheme, even if BECCS is applied to both units.

2.5.37. **Post-Hearing Note**: *The Applicant notes that the statement in 4.2.41 'The government plans to publish a Bioenergy Strategy in 2022, which will establish the role which BECCS can play in reducing carbon emissions across the economy. It notes that current evidence strongly suggests that, given limited sustainable biomass supply, the government may need to prioritise the use of biomass where it can be combined with CCS (i.e., BECCS), resulting in negative emissions" relates to the comment by the Government on page 20 of the Policy Statement that: "Recognising that sustainable biomass is a limited resource, it is important to ensure that biomass is prioritised within the economy where it offers the greatest opportunity to reduce greenhouse gas (GHG) emissions in 'hard to abate' sectors where there are fewer options to decarbonise through alternative low carbon technologies".*

2.5.38. This is the Government recognising that in the context that industry needs to decarbonise, choices need to be made about where GHG emissions can be significantly reduced. In this case, a biomass power plant at Drax offers the opportunity to create such large savings, but that needs to be seen in the context of sustainable biomass itself being a limited resource in a global sense. The quote is therefore not about supply to Drax specifically.

2.5.39. **Katy Brown** noted that the Scheme proposed reducing the output to the National Grid, as discussed above, and queried whether there would be compensation for this elsewhere in the form of fossil fuels.

2.5.40. **James Hewitt** referred to the Applicant's supply chains and raised concerns in relation to these. **The ExA** noted that, whilst concerns over supply chains are biomass are understood, the purpose of the Examination is to examine the Scheme, which is only for a carbon capture element to an existing power plant.

2.5.41. **Richard Griffiths** highlighted that the Applicant had responded to these concerns above.

2.5.42. **Mary Dickinson** noted that the IPCC guidance contains qualifications on biomass and sustainability. **Richard Griffiths** stated that the supply chain has been assessed within the GHG assessment that sits before the ExA. Whilst the qualifications are not disputed, it is the intention of the Government to strengthen the existing sustainability criteria for biomass where possible.

2.6. AGENDA ITEM 5 – THE PROPOSED DEVELOPMENT IN THE CONTEXT OF THE EAST COAST CLUSTER

2.6.1. **The ExA** asked for an explanation of the relationship of the Scheme to Zero Carbon Humber ("**ZCH**"), the Northern Endurance Partnership ("**NEP**") and the Humber Low Carbon Pipeline ("**HLCP**").

2.6.2. **Iain Harris** noted that the Applicant is a founding partner of the ZCH Partnership and remains so, alongside a further 13 members who intend to build the UK's first industrial cluster. In 2021, the ZCH was incorporated within the wider Humber/Teesside East Coast Cluster, which was successful in being selected by

BEIS as a Track 1 cluster for deployment by 2027. The ZCH is seeking to develop the first net zero cluster by 2040 and has received funding from the ISCF grant.

2.6.3. **Iain Harris** then stated that NEP (a partnership between BP, National Grid, Equinor, Shell and Total) has been selected as the CO2 transport and storage provider for the East Coast Cluster. The Applicant and the NEP continue to work closely together to ensure their projects are compatible with one another, both in design and capacity.

2.6.4. **Iain Harris** confirmed that the HLCPs are proposed CO2 and Hydrogen pipelines which run from the Plant to the coast at Easington, where the CO2 transportation pipeline will connect to offshore CO2 transportation and storage infrastructure. The Northern Endurance Partnership is the anticipated operator for these pipelines and has just finished the statutory consultation as it prepares to apply for the necessary planning consent.

2.6.5. **Iain Harris** also noted that, in terms of the consenting regime for the offshore pipeline, this will involve the Pipeline Works Authorisation, which operates through the North Sea Transition Authority ("**NSTA**"). The construction of infrastructure necessary for the storage facility will also be consented for by the NSTA. BP, National Grid Carbon and Equinor are all on the licence which is held for the storage site – they have a licence to store CO2 but must apply for a permit to amend that licence, which will be submitted around Q3 of 2023. Following that, it will take around six months for the NSTA to determine whether a permit may be awarded.

2.6.6. **The ExA** queried the lifespan of the storage capacity. **Iain Harris** responded that this is determined by who the emitters connecting to the various pipelines are. The current assessment is around 450 million tonnes, with 17 million tonnes per year coming through from Teesside and Humber. **The ExA** queried if the storage could become full during the lifecycle of the Scheme, to which **Iain Harris** answered that this is unlikely, though it does depend on the number of pipelines and rate of annual injection. Should this be the case, the Applicant is already looking at alternatives.

2.6.7. **Oksana Price** noted that NGCL are promoting the HLCPs and confirmed that the latest material in relation to this is the consultation material found on their website (from the second round of consultation in October 2022), with NGCL currently considering feedback received.

2.6.8. **The ExA** asked if the viability of the ZCH is dependent on the development of the Scheme. **Iain Harris** stated that the ZCH is striving to make the Humber the first decarbonised net zero industrial cluster in the world, with the Applicant being part of the Humber industrial cluster plan. All parties to the ZCH consider the Scheme to be a key part of decarbonised development in the Humber. **Oksana Price** noted that the HLCP is not dependent on any individual transmitters nor proposed schemes, but that the HLCP has been designed to accommodate those transmitters connecting along its route.

2.6.9. **The ExA** queried what would happen to the captured carbon in the event of a problem with the pipeline. **Catriona Reynolds** stated that this would depend in the

final design of the Business Model – the priority is negative emissions generation, but BEIS will ultimately decide and the Applicant will comply with that. **The ExA** asked if this is also controlled by the aforementioned environmental permit requirement of 95% capture, to which **Chris Summers** responded that this would be a factor – the Applicant would, in this event, need to discuss with BEIS as to whether it is the Best Available Technique to operate without the carbon capture facility.

2.6.10. **The ExA** noted that the precise nature of the interface with the pipeline is yet to be confirmed, with two options proposed for the location of the connection (as outlined in the Environmental Statement), and asked what factors are in consideration for determining which option is chosen. **Jim Doyle** noted that there are effectively five options for this – one within the Applicant's site, which would include the pipeline from the Applicant's compressor system (which NGCL would own), then a further four options outside the Applicant's site that NGCL have consulted on. Ultimately the decision is for NGCL.

2.6.11. **Oksana Price** confirmed that Option D is currently viewed as preferable for NGCL, but this may change as they are still considering the consultation feedback. In any event, NGCL considers that the Applicant's drafting of Work No. 2 is appropriate and the parties are entering into a Statement of Common Ground as well. **Richard Griffiths** noted that the draft DCO, at Article 6, provides NGCL with the benefit of Work No. 2.

2.6.12. **The ExA** queried if this interface could be determined within the timescale of this Examination, to which **Richard Griffiths** and **Oksana Price** both agreed that at present (and noting that the option within the Order limits is on Drax land), given the status of the pipeline DCO application, it is sensible for both Work Nos. 2A and 2B to remain in the draft DCO, with the position being kept under review during the Examination.

2.6.13. **The ExA** again noted the Keadby 3 project, in which the DCO contained a requirement to not develop until the appropriate consents had been granted for the T+S infrastructure. **Richard Griffiths** re-confirmed that the Applicant intends to submit a revised and updated draft DCO and submissions at Deadline 2 setting out its position on this matter.

2.7. AGENDA ITEM 6 – ALTERNATIVES

2.7.1. **The ExA** asked the Applicant about its consideration of reasonable alternatives, including locations within the site and alternative technologies, with reference to section 6.1.3 of the Environmental Statement.

2.7.2. **Catriona Reynolds** noted that there were specific policy reasons, as have been discussed, as to why BECCS was chosen ahead of other GHG removal technologies – for example, the NZS and the Business Model.

2.7.3. **Jim Doyle** added that several engineering routes are available to remove CO2 from combustion gases generated through power generation, but that the most widely

applied and best used technique is via a solvent mechanism. The Applicant has applied solvent-based technology successfully already, through its pilot programme.

2.7.4. **The ExA** queried if, in choosing the location for BECCS and the additional infrastructure required, there was an assessment of relative environmental impacts between these options, or whether the decision was driven by operational efficiency. **Jim Doyle** responded that a south-based solution was considered, but the north-based solution chosen could fit within the existing infrastructure (e.g. in relation to water cooling). Given that the footprint of the main BECCS plant is on the FGDP facility, some piles that exist there will be reused. The north-based solution minimises the pipe run carrying CO2 from the compressor station out to the connection port in the transport and storage system, compared to the south-based solution.

2.7.5. **The ExA** asked if there were any potential adverse environmental impacts of the north-based solution compared to the south-based solution, which **Jim Doyle** confirmed was not the case. **Nicola Ashworth** added that there is text included in Chapter 3 of the Environmental Statement with covers the difference between the northern and southern options, with the likely environmental impacts being less significant for the northern option compared to the southern option, including footprint size, reusing of piles and pipe run length.

2.7.6. **The ExA** asked if the solvent makeup used in the Applicant's pilot programme is the same as proposed for the Scheme. **Chris Summers** stated that two solvents were tested with the flue gas – KS1 for the pilot and KS21 being the newer solvent for the Scheme. **The ExA** sought clarification that any non-amine solvent technology remains a non-viable option for the Scheme, which **Jim Doyle** confirmed.

2.7.7. **The ExA** noted that there are a number of design options still in consideration, referencing Chapter 2 of the Environmental Statement, including the CO2 delivery compound, the construction programme and the abnormal indivisible load route across the M62, and asked if there had been any progress on these matters. **Richard Griffiths** responded that the application documents still reflected the current position.

2.7.8. **James Hewitt** noted that the Plant was constructed in two phases, one of which is ageing, and asked which units were being proposed for BECCS. **Jim Doyle** answered that this was Units 1 and 2. **James Hewitt** also asked whether, given that the FGDP facility is being removed, the sulphur corrosion impact has been considered. **Jim Doyle** stated that the sulphur emissions from BECCS are significantly lower than for a coal unit.

2.8. AGENDA ITEM 7 – REVIEW OF ISSUES AND ACTIONS ARISING

2.8.1. **Bethan Tuckett-Jones** noted that a question was raised earlier (see paragraph 2.4.16 above) regarding the temperature of the flue gases within the existing units, compared to when BECCS is installed, and answered that the temperature is currently 144 Celsius but decreases to 80 Celsius with BECCS in its basic form. As part of the Applicant's mitigation plan to reduce the air quality impact, the temperature

will be reheated to 103 Celsius. It was noted that the system was modelled at 100 Celsius, so the Applicant has built in a degree of conservatism to its modelling.

2.9. AGENDA ITEM 8 – ANY OTHER BUSINESS

2.9.1. **Katy Brown** noted that as there is no flue gas desulphurisation taking place, there will be more contamination in the solvent, and asked what was being put in place by the Applicant to mitigate against this. **Jim Doyle** responded that biomass has a lower sulphur content, meaning that desulphurisation is not required to meet the requirements of the environmental permit and is therefore not being run. However, the Applicant is performing a pH adjustment within the operation of the quench column, which will mitigate the sulphur dioxide levels and avoid the solvent being contaminated.

2.9.2. **James Hewitt** asked when the use of heat at the Plant will be considered. **The ExA** noted that the purpose of the Examination is to examine what is before it, which is carbon capture, rather than what may happen at the Plant in the future. **Richard Griffiths** added that the application is not for a new generating station and referred to the above summary in relation to EN-3.

3. OPEN FLOOR HEARING 1

3.1. INTRODUCTION

3.1.1. A number of submissions were made at the Open Floor Hearing by Interested Parties. As expressed by **Richard Griffiths,** the vast majority of those submissions had already been responded to by the Applicant in its response to Relevant Representations [PDA-002], so they are not repeated here – see in particular tables 12, 17 and 22 of that document.

3.1.2. The exception to this is the queries raised by Michael Chaloner at the Hearings, which reflected his submissions prior to the Hearing at PDA-014. The Applicant's response to those questions is therefore set out below.

3.2. RESPONSE TO MICHAEL CHALONER

Question Number	Question	Response
Submission ID: 13146		
1	How long after constructing this absorption process can it be expected that the operation will remain usable?	The design life for the Scheme is 25 years.
2	Will it be effectively public money that will pay for this construction and the running of this process?	Please find below text taken from the 'Power BECCS' consultation document published in August 2022 from the Government which identifies the funding mechanisms currently being explored for this type of technology. Document titled "Business model for power bioenergy with carbon capture and storage ('Power BECCS') A consultation seeking views on potential business models for power bioenergy carbon capture and storage". *"The preferred funding mechanism includes a contract for difference (CfD) model which takes account of electricity and carbon. This option offers a combination of a CfD for electricity generation (£/MWh) and a CfD for Carbon (£/tCO_2) – intended as a dual payment mechanism under one CfD contract framework. This differs from the other options principally due to allowing for flexibility to include negative emissions in any*

Question Number	Question	Response
		appropriate carbon market in the future. The benefit of this is that it fulfils the 'polluter pays' principle, with emitters paying the costs of removals and could reduce the proportion of support payments". The Contracts for Difference (CfD) scheme is the government's main mechanism for supporting low-carbon electricity generation. CfDs incentivise private investment in renewable energy by providing developers of projects, such as BECCS, with high upfront costs and long lifetimes with direct protection from volatile wholesale prices, and they protect consumers from paying increased support costs when electricity prices are high. So, in this instance, Drax will fund the construction costs of the project and will receive a CFD for the electricity and carbon captured.
3	Is independent data readily available on the state of the atmosphere around the Drax plant?	It is not clear which data the question is referring to. The air dispersion model has utilised meteorological data as part of the baseline data which is independently verified and the modelling is checked by the Environment Agency's Air Quality Monitoring and Assessment Unit. The on-going monitoring of the air quality impacts of the Scheme would take place pursuant to the permitting process, as is standard for all power plants
4	What extra safety processes will the company plan to take care over the handling of the toxic amine absorbent?	Drax takes its responsibilities to staff and the public extremely seriously. Drax has significant experience in handling materials know to be hazardous to health, for example concentrated acids, fuel oils, chlorinated products as well as various fuels. The solvent will be handled with the same degree of care and attention as all potentially hazardous materials and will

Question Number	Question	Response
		comply with all health and safety legislation associated with the storage of such chemicals.
Submission ID: 13249		
1	How long will this carbon dioxide removal system work?	The design life for the Scheme is 25 years.
2	Is public money needed to pay for this installation?	Please find below text taken from the 'Power BECCS' consultation document published in August 2022 from the Government which identifies the funding mechanisms currently being explored for this type of technology. Document titled "Business model for power bioenergy with carbon capture and storage ('Power BECCS') A consultation seeking views on potential business models for power bioenergy carbon capture and storage". *"The preferred funding mechanism includes a contract for difference (CfD) model which takes account of electricity and carbon. This option offers a combination of a CfD for electricity generation (£/MWh) and a CfD for Carbon (£/tCO_2) – intended as a dual payment mechanism under one CfD contract framework. This differs from the other options principally due to allowing for flexibility to include negative emissions in any appropriate carbon market in the future. The benefit of this is that it fulfils the 'polluter pays' principle, with emitters paying the costs of removals and could reduce the proportion of support payments".* The Contracts for Difference (CfD) scheme is the government's main mechanism for supporting low-carbon electricity generation. CfDs incentivise private investment in renewable energy by providing developers of projects, such as BECCS, with high upfront costs and long lifetimes with direct protection from volatile wholesale prices,

Question Number	Question	Response
		and they protect consumers from paying increased support costs when electricity prices are high. So, in this instance, Drax will fund the construction costs of the project and will receive a CFD for the electricity and carbon captured
3	How can the public be informed of the state of the atmosphere around the plant?	It is not clear which data the question is referring to. The air dispersion model has utilised meteorological data as part of the baseline data which is independently verified and the modelling is checked by the Environment Agency's Air Quality Monitoring and Assessment Unit. The on-going monitoring of the air quality impacts of the Scheme would take place pursuant to the permitting process, as is standard for all power plants.
4	What will be the special safety procedures for working of the toxic amine plant?	Drax takes its responsibilities to staff and the public extremely seriously. Drax has significant experience in handling materials know to be hazardous to health, for example concentrated acids, fuel oils, chlorinated products as well as various fuels. The solvent will be handled with the same degree of care and attention as all potentially hazardous materials and will comply with all health and safety legislation associated with the storage of such chemicals.

APPENDIX 1: SUMMARY OF THE GHG ASSESSMENT PROCESS FOR THE SCHEME

ISH1-AP1: PROVIDE CLARIFICATION OF THE CALCULATION OF NEGATIVE EMISSIONS FOR THE WHOLE PLANT.

Chapter 15 (Greenhouse Gases) (APP-051) of the Environmental Statement provides an assessment of the Proposed Scheme (units 1&2 only). In the Planning Statement (APP-032) it is stated that the whole plant will have negative emissions once the proposed development has been completed. To support the statement that the whole plant will have negative emissions further calculations have been undertaken for the whole plant on a do something basis on the following bases:

- Units 1 and 2 will operate as outlined in the with development scenario within Chapter 15 (Greenhouse Gases) of the Environmental Statement.
- Units 3 and 4 will operate at full capacity, with the same efficiency as units 1 and 2 in the baseline scenario as presented in Chapter 15 (Greenhouse Gases) of the Environmental Statement and will combust biomass without CCS. This is a worst-case scenario for the purposes of this assessment, noting that the ES has otherwise assumed a mid-merit scenario for these units.
- Units 5 and 6 will be decommissioned.
- The same emissions sources have been included as within Chapter 15 (Greenhouse Gases) of the Environmental Statement. However, to cover the whole plant additional scope 1&2 sources associated with the operation of the plant but not the Proposed Scheme have also been included. These form part of the Applicant's annual disclosure, in accordance with the GHG Protocol, and are as follows:
    - Heavy Fuel Oil - 22,000 tonnes (86ktCO2e)
    - Light Fuel Oil – 2,200 tones (9ktCO2e)
    - Electricity imported from the grid - 250,000 MWh (65ktCO2e)

These results of this calculation are presented below:

Data Type	Value	Unit	Source
Total electricity generated (net)	2,212	MW	Aligned with BEIS Annex C submission
Total Proposed Scheme electricity generated (net)	19,380,339,609	KWh	Calculation: Total electricity generated (net)*1000*8760 hours
Boiler efficiency (net)	28.8 (units 1&2) 39.7 (units 3&4)	%	Net efficiency based on BEIS Annex C submission. Net Efficiency includes unit works power, station works power, CCS works power and process steam power loss. CCS works power does not include high pressure compression.

Data Type	Value	Unit	Source
Total energy in wood	56,558,267,003	kWh	Calculation: ((Total electricity generated*100) / (boiler efficiency))
Calorific value of wood (net cv)	17,600	KJ / kg	Drax Power Ltd Financial Model
Calorific value of wood (net cv)	4.89	kWh / kg	Calculation: 17600/3600
Total wood used	11,568,736,432	Kg / yr	Calculation (Total energy in wood / calorific value of wood)
Wood Emissions Factor	1.675	tCO_2e / t	Specific emission factor for the Drax Combustion Process
Total Combustion Emissions	19,383,134,614	$kgCO_2e$	Calculation: (Total wood used * Wood Emissions Factor)
Total Combustion Emissions	19,383,135	tCO_2e	Calculation: (Total Combustion Emissions/1000)
CO2 captured through the Carbon Capture process B1	-9,206,989	tCO_2 / yr	The Applicant estimates the Carbon Capture technology to capture approximately 95% of all CO_2 from two biomass units.
Supply chain GHG Emissions rate	109	$KgCO_2e$ / MWh	https://www.drax.com/sustainability/sustainable-bioenergy/sourcing-sustainable-biomass/
Operational Supply chain GHG Emissions – D	2,447,446	tCO_2e / yr	Calculation: Supply chain emissions (Baseline – 2x units at Full Load) + Supply chain emissions (Original do something scenario – 2x units at mid-merit load)
Construction GHG Emissions (A1-A5)	104,700	tCO_2e	BoQ provided by the design team Incorporates 212 tonnes of carbon released at construction phase from land use, land use change and forestry (LULUCF).
Years of operation	25	Years	Provided by the Applicant

Data Type	Value	Unit	Source
Annual Construction GHG Emissions (C1-C5) for Units 1 and 2 conversion to BECCS	4,188	tCO_2e / yr	Calculation 104,700/25
Annual Solvent GHG Emissions (B8)	6,939	tCO_2e / yr	Calculation: annual quantity of KS-21 solvent * (NH_3 EF + Ethylene EF)
LULUCF (B8)	707	tC	Habitat data and carbon storage calculation
LULUCF during operation (B8) per annum	28	tC/yr	Habitat data and carbon storage / years of operation
Additional scope 1&2 sources associated with the operation of the plant but not the proposed development (D)	160,000	tCO2	Drax
Total GHG Emissions of the plant	-6,588,388	tCO_2e / yr	Total GHG emissions = Operational Carbon (B1-B8) + Biomass supply chain Emissions + construction carbon per annum.
GHG Emissions Rate	-340	gCO_2e / kWh	GHG emissions rate = (Total GHG emissions*10^6) / total proposed scheme electricity generated

This calculation demonstrates that the plant will have negative emissions once the Proposed Scheme has been completed.

ISH1-AP2: PROVIDE EXTRACT OF IPCC GUIDANCE REGARDING THE CALCULATION OF CO2 AT POINT OF COMBUSTION OF BIOMASS.

The two pertinent paragraphs relevant to our response are below.

From the 2019 amendments[2]: “Carbon dioxide (CO_2) emissions from the combustion of biomass or biomass-based products are captured within the CO_2 emissions in the AFOLU sector through the estimated changes in carbon stocks from biomass harvest, even in cases where the emissions physically take place in other sectors (e.g., energy). This approach to estimate and report all CO_2 emissions from biomass or biomass-based products in the AFOLU sector was introduced in the first IPCC guidelines for national greenhouse gas emissions (IPCC 1995), reflecting close linkages with data on biomass harvesting, and for the pragmatic reason to avoid double counting.”

From the original 2006 guidance[3] (unchanged in the 2019 amendments)): “If the [CCS] plant is supplied with biofuels, the corresponding CO_2 emissions will be zero (these are already included in national totals due to their treatment in the AFOLU sector), so the subtraction of the amount of gas transferred to long-term storage may give negative emissions. This is correct since if the biomass carbon is permanently stored, it is being removed from the atmosphere.”

ISH1-AP4: PROVIDE RELEVANT EXTRACT FROM IMA REGARDING THE REPORTING OF COUNTRIES’ GHG EMISSIONS.

During the hearing the scope of the GHG assessment with regards to geographical boundaries was referred to. This is dealt with in Section 15.6 of Chapter 15 (Greenhouse Gases) of the Environmental Statement where is stated that “*The GHG assessment is not restricted by geographical area but instead includes any increase or decrease in GHG emissions as a result of the Proposed Scheme, wherever that may be*”. This is because GHG assessments for EIA are required to quantify the impact of the proposed development through a Baseline vs Do-Something comparison. This means, boundaries such as geographical or organisational boundaries cannot be used as a reason for including or excluding emissions – it’s the difference between the two scenarios that is relevant not where the impact occurs or who is responsible. This is also covered in the guidance from IEMA[4]. Relevant extracts from this guidance are provided below (Page 15):

- The assessment should seek to quantify the difference in GHG emissions between the proposed project and the baseline scenario (the alternative project/solution in place of the proposed project). Assessment results should reflect the difference in whole life net GHG emissions between the two options
- The assessment must include all material emissions (defined by magnitude, see Section 5.3, Step 3 for (the exclusion threshold), direct or indirect (based on the point above), during the whole life of the proposed project. The boundary of the assessment should be clearly defined, in alignment with best practice.

[2] Full guidance (2019, updated) 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories guidance - [redacted]

[3] Full guidance (2006): Chapter 2 Volume 2, 2.3.3.4 on treatment of biomass and 2.3.4 on treatment of CO2 capture and storage 2006 guidance - [redacted]

[4] [redacted]

Chapter 15 (Greenhouse Gases) (APP-051) of the Environmental Statement details the boundary of the assessment in Section 15.4 (Scope of the Assessment) and 15.6 (Study Area). Section 15.4 clearly defines the emissions sources included within the assessment, and Section 15.6 clearly defines how geographical boundaries do not constrain the assessment. The selection of emissions sources for inclusion is comprehensive and includes all material emissions. This, as well as the use of a Baseline vs Do-Something comparison, instead of geographical or organisational boundaries, aligns to best practice. The term best practice is used as shorthand for principles that are well understood as appropriate best methods by carbon management practitioners. There is no one set of principles, or one place where best practice is defined. However in this case it is suggested that the principles, as defined by the IEMA guidance, as well best practice GHG accountancy principles (including those defined by the GHG protocol corporate standard[5]) are applicable and have been applied to Chapter 15 (Greenhouse Gases) of the Environmental Statement.

[5] [redacted]

APPENDIX 2: STATEMENT ON SECTION 104 AND SECTION 105 OF THE PLANNING ACT 2008 IN RESPECT OF THE SCHEME

INTRODUCTION

This note sets out the Applicant's case as to why it is considered that the Scheme should be considered by the ExA and Secretary of State under section 104 of the Planning Act 2008 ('the Act').

It goes on to set out the reasons why that, if in the alternative, it is considered by the ExA or Secretary of State that section 104 should not apply, and instead that section 105 is relevant, how the latter should be applied in respect of the Scheme.

The Applicant wishes to make clear from the outset, however, that it does not consider that the procedural route by which a decision is reached should affect the outcome of the Application. Whether the Application is determined in accordance with the relevant NPSs or they are treated as important and relevant considerations will not have a material impact on the decision given the established need for and significant public interest benefits of the Scheme, the limited adverse impacts and the overall consistency with relevant policy.

Accordingly, the Applicant considers that it would be prudent for the ExA to consider (and be stated in its Recommendation Report) what its recommendation would be on both bases (both section 104 and section 105 of the Act), so as to enable the Secretary of State to determine the Application with the benefit of that advice, whichever statutory route he ultimately determines to be appropriate, and if necessary, to make an 'in the alternative' determination, if felt prudent.

The Applicant notes that, for the reasons set out in the Planning Statement [APP-032] and Needs and Benefits Statement [APP-033], whether it is considered that section 104 or section 105 applies, the emerging National Policy Statements should be seen as an 'important and relevant' consideration under either section 104(2)(d), or section 105(2)(c), whichever is applied.

THE SCHEME AND ITS RELATIONSHIP TO THE EXISTING POWER STATION

Consideration of this matter will be aided by a reminder of how the Scheme interacts with the Existing Power Station.

In particular, as is set out in the Explanatory Memorandum [AS-078]:

- the design of the Scheme means that it will become wholly incorporated into the physical structure of the Existing Drax Power Station and when constructed will only be capable of operating with the Existing Drax Power Station. The effect of the extension (the Scheme) will be that Units 1 and 2 of the Existing Drax Power Station will not only generate electricity but also produce negative emissions in generating that electricity; and
- the Scheme therefore involves the modification, upgrade and extension of existing apparatus which will result in the Scheme becoming an integral part of the process of generating electricity at the Existing Drax Power Station. For example, the Proposed Scheme will form part of the water cycle of the Existing Drax Power Station and therefore part of the process of the generation of electricity as explained in this section.

The Scheme is therefore an extension to the generating station and is fully intertwined with it – it will essentially become 'part of' the generating station itself.

STATUTORY PROVISIONS

Section 104 of the Planning Act 2008 sets out that: "This section applies in relation to an application for an order granting development consent if a national policy statement has effect in relation to development of the description to which the application relates".

The key question to consider is therefore whether the 2011 NPSs EN-1 and EN-3, as the prevailing national policy statements for the Scheme, have effect in relation to development of the Scheme's description.

This question should be seen in the context that the Applicant understands that the Scheme is the first 'extension of a generating station' NSIP considered under the Act regime (the recently submitted Slough Multi Fuel Extension project following just behind it).

Section 105 of the Act sets out that; "This section applies in relation to an application for an order granting development consent *if section 104 does not apply in relation to the application".*

Sections 104 and 105 are therefore mutually exclusive.

Sections 104 and 105 should be see in the context of the Act as a whole, which sets out to create categories of nationally significant infrastructure projects as well as NPSs. In particular it should be noted that:

- section 14 lists out the projects that can be considered as 'nationally significant infrastructure projects' and at subsection (1)(a) refers to the "construction or extension of a generating station"; and
- section 15 goes on to say that "the construction or extension of a generating station is within section 14(1)(a) only if the generating station is or (when constructed or extended) is expected to be within subsection (2)…". Subsection (2) goes on to specify onshore generating stations whose capacity is more than 50 megawatts as being a "generating station within this subsection".

It can therefore be seen that the focus of the nationally significant infrastructure project definition is on the capacity of the generating station.

CASE LAW

In interpreting these statutory provisions, the recent case of EfW Group Ltd vs SSBEIS[6] provides helpful guidance.

This case related to decision making with regard to an application for consent for a project which was made up of:

- the construction and operation of a waste to energy generating station with total generating capacity of up to 75MW (49.9MW consented + 25.1MW upgrade), know as K3; and

[6] [2021] EWHC 2697 (Admin)

- the construction and operation of a 42MW generating station also to be an energy to waste plant, known as WKN. WKN did not constitute a NSIP; but had been brought into the Planning Act 2008 regime as 'development for which development consent is required' pursuant to a successful direction application under section 35 of the Act.
-

The Court in this case was asked to determine the applicability of section 104 and section 105 to each of the individual plants which made up the application, as the ExA and Secretary of State had come to differing views on the matter. In considering this question, the Court considered the proper scope of sections 104 and 105.

The following points are notable in the judgement of the Court arising from that consideration:

- Firstly, the Secretary of State's position in that case on how section 104 should be applied, as set out in paragraph 54 of the judgement: "the defendant submits, firstly, that the starting point for addressing the question of whether section 104 applies is to examine whether an NPS applies to the project which is being evaluated. In this case a clear policy choice was made in the designation of the NPS that it should only apply to projects fulfilling the statutory definition of an NSIP, and therefore that it cannot apply to the WKN proposal. Once that is understood, if section 104 of the 2008 Act were to be deployed to determine the WKN proposal this would have the effect, in practice, of expanding the application of the NPS to a scale of project for which it had never been intended. Such an approach would be quite inconsistent with the centrality of the NPS within the statutory framework devised by the 2008 Act. As noted above, the contents of an NPS are not open to question within the decision-making process, and that includes the thresholds adopted for the application of the NPS in the policy"; and
- Secondly, the conclusions of the judge himself in paragraph 60 that: "The question arises as to whether or not the section 35 direction which was made in relation to WKN has the effect of bringing it within the scope of the decision-making framework pursuant to section 104. In my view it does not. I am unable to accept the submission that the terms of section 35(1) have the effect of turning a project or development which does not fall within the definition of NSIPs provided within sections 14 and 15 of the 2008 Act into a project which has such a designation. The words "be treated as development for which development consent is required" simply have the effect of making the proposed development subject to the decision-making framework contained within the provisions of the 2008 Act. They do not change the understanding of the proposal as not being within the definition of an NSIP, any more than they change the physical nature of what is comprised within the development. More particularly, they cannot have the effect of altering the scope of an NPS which has been drafted specifically to apply only to those projects that are within the definition of an NSIP".

There is therefore a link made by both the Secretary of State and the Courts between projects being a NSIP and being considered to be subject to the NPS.

NATIONAL POLICY STATEMENTS EN-1 AND EN-3 – 'HAVING EFFECT'

Paragraph 1.4.2 of EN-1 discusses the applicability of that NPS. It states that:

> *"the Planning Act 2008 sets out the thresholds for nationally significant projects in the energy sector. The Act empowers the IPC to examine applications and make decisions on the following nationally significant energy infrastructure projects:*

- Electricity generating stations generating more than 50 megawatts onshore and 100 megawatts offshore. This includes generation from fossil fuels, wind, biomass, waste and nuclear. For these types of infrastructure, the Overarching NPS (EN-1) in conjunction with the relevant technology specific NPSs (EN-2 on fossil fuel generating stations, EN-3 on renewable energy infrastructure or EN-6 on nuclear power generation as appropriate) will be the primary basis for IPC decision making"…

The Applicant considers that it is this paragraph which determines the 'development' to which the NPS has effect when considering section 104 of the Act.

For the purposes of the Scheme, whilst it is acknowledged that this paragraph does not specifically utilise the word 'extension', the Applicant notes that:

- the first bullet point and the remaining bullet points are set in the context of them being projects that are nationally significant infrastructure projects, the first being section 15, the other bullet points considering sections 16-21 of the Act;
- this approach of identifying NSIPs as being caught by the NPS is consistent with the line of reasoning set out in the EfW Group case as the definitions of NSIP being the driving force of what is covered by a NPS;
- the bullet point mirrors the language of section 15 which, as discussed above, refers to nationally significant infrastructure projects as including those which relate to (whether through construction or extension) a generating station whose generating capacity is over 50 MW, or, put in the language of the NPS, a 'electricity generation station generating more than 50 megawatts onshore'; and
- neither does it specifically reference 'the construction of' electricity generating stations in this paragraph and the Applicant considers it would be incorrect to add words to that policy, in the context of the NSIP definitions.

For the purposes of section 104, it is therefore considered that NPS EN-1 applies to NSIPs which involve generating stations of over 50MW capacity; which is the case for the Scheme, as highlighted in section 2.

It is considered that similar logic applies to the applicability of EN-3, on the basis that:

- reading the first bullet point in paragraph 1.4.2 together, it can be seen that it goes on to consider the other NPSs in relation to the 'types of infrastructure', including biomass, that involve an electricity generating station, that is a NSIP; meaning that EN-3 should be read in conjunction with EN-1 in respect of such projects;
- paragraph 1.8.1 of EN-3 states that it applies to the following types of nationally significant renewable energy infrastructure: energy from biomass greater than 50 MW. The Applicant's position is that, reading this with EN-1, this categorisation includes any type of NSIP which involves an energy from biomass plant, such as the Scheme. There is no requirement in policy that it must involve the construction of a new plant.

NATIONAL POLICY STATEMENT EN-1– NEED CASE

Going beyond the simple description of development position, the Applicant considers that it is clear that the Scheme accords with the overarching need case and context of the policy being set (and pursuant to 1.4.2, also applies to EN-3) for "energy infrastructure" and in particular

'nationally significant energy infrastructure projects', which are the phrases used throughout NPS EN-1, but particularly in section 1.4.

In particular, the Applicant notes:

- paragraphs 3.1.1 to 3.1.4 of EN-1 emphasise the need for energy infrastructure projects in order to achieve energy security and dramatically reduce the GHG emissions in the UK. The NPS outlines the Government's need for low carbon developments (including fossil fuel generation with CCS) and that "substantial weight" should be given to the contributions of projects which satisfy that need when considering applications for development consent under the Planning Act 2008. The Scheme comprises the construction of a new, nationally significant energy infrastructure in the form of CCS which will remove approximately 95% of carbon dioxide from the flue gas emissions produced during the combustion of biomass in Units 1 and 2 at the Drax Power Station. This is a significant reduction of carbon emissions and will result in overall negative emissions of greenhouse gases. The Scheme therefore directly addresses the 'urgent need' set out in Part 3 of EN-1;
- paragraph 3.3.15 of EN-1 notes that "[i]n order to secure energy supplies that enable us to meet our obligations for 2050, there is a urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible, and certainly in the next 10 to 15 years, given the crucial role of electricity as the UK decarbonises its energy sector" [our emphasis]. The Scheme is a new energy NSIP being brought forward to decarbonise a significant piece of the UK's energy sector;
- paragraph 3.6.5 of EN-1 notes that '"[t]he IPC should take account of the importance the Government places on demonstrating CCS, and the potential deployment of this technology beyond the demonstrate stage, in considering applications for consent of CCS projects and associated infrastructure". The Applicant submits that the Government could not have conceived of the IPC (as decision maker at the time of EN-1) considering CCS projects, if they were not considered to form developments for which the NPS would apply; and
- it is noted that paragraphs 3.6.4 and 3.6.5 of EN-1 again do not require such projects to be 'new', with 3.6.4 considering dependency on unabated fossil fuel generating stations needing to be reduced and that "less is known about the impact of CCS on the economics of power station operation", thus implying that such infrastructure could be applied to existing infrastructure.

CONCLUSION ON SECTION 104

The Scheme involves the extension of a generating station that has a capacity of over 50MW. It therefore constitutes a nationally significant infrastructure project for the purposes of sections 14 and 15 of the Act.

Case law suggests, and NPS EN-1 states, that the NPS should be considered to apply to nationally significant infrastructure projects. The NPS at no point suggests that such projects, in respect of generating stations, must involve only the construction of a generating station.

Reviewing paragraph 1.4.2 as a whole, this logic flows through also to the description of development (in this case an energy from biomass plant) set out in NPS EN-3.

It is therefore considered that the Scheme is a "*development of the description"* in relation to which EN-1 and EN-3 have effect.

As a consequence, this application should be determined pursuant to section 104 of the Act.

SECTION 105

As noted above, whilst the Applicant is confident that section 104 applies to the Scheme, it may be considered appropriate for the ExA to make a recommendation on what the decision should be if it was considered that section 105 would apply in the alternative.

In such a situation, the Applicant acknowledges that the statements in paragraph 1.4.2 of EN-1 that the NPS should have 'primacy' may not be applied; and indeed that there would be no requirement on the application to be determined in accordance with EN-1 or EN-3.

However, even if it was considered that the NPSs should only be treated as one of many other 'important and relevant' considerations, this would make little difference to the consideration of the application, given the sheer weight of policy support and identified need for the Scheme in other Government policy, international policy, the emerging NPSs, that would make up other important and relevant considerations in the determination, on top of the urgent need for low carbon infrastructure identified in EN-1 and EN-3.

Whilst it is acknowledged that the ExA and Secretary of State will need to also take account of the submitted Local Impact Report from the LPAs, based upon the Environmental Statement, the discussions with the LPAs to date reflected in the SoCG also submitted at Deadline 1, and as set out in the Planning Statement and Needs and Benefits Statement, it is considered that there are no potential adverse impacts which could be identified in the Local Impact Report which would warrant the refusal of the application, when weighed in the planning balance against the benefits of the Scheme, including most notably the Scheme's significant contribution to achieving the goal of net zero.

In the Applicant's submission, the difference between applying section 104 or section 105 to a decision on the Scheme would rest predominantly on the 'weight' that is given to EN-1 and EN-3 by the decision maker. The Applicant's case is that even if less weight were to be applied to the need and policies identified within those documents, the Scheme's benefits are still identifiable, quantifiable and of such great public benefit as elucidated in a range of other documents so as to render the consideration of the weight of such documents to be a moot point.