



GRID CONNECTION STATEMENT

Drax Bioenergy with Carbon Capture and Storage

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 6(1)(a)(i)

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DOCUMENT OWNER: C. Hachmann

AUTHOR: C. Hachmann

APPROVER: C. Fountain

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EXECUTIVE SUMMARY

The Grid Connection Statement has been prepared to support Drax Power Limited's (the 'Applicant') application (the 'Application') for a Development Consent Order (a 'DCO') that is made to the Planning Inspectorate ('PINS') under Section 37 of The Planning Act 2008 (as amended) (the '2008 Act') (Parliament of the United Kingdom, 2008) in respect of the Drax Bioenergy with Carbon Capture and Storage ('BECCS') project.

The Proposed Scheme would involve the installation of post combustion Carbon Capture technology to capture carbon dioxide from up to two existing 660 megawatt electrical ('MWe') biomass power generating units at the Drax Power Station (Unit 1 and Unit 2). The Scheme is designed to remove approximately 95% of the carbon dioxide from the flue gas from those two units.

The Proposed Scheme includes new Combined Power Turbines which will be dual purpose. The Combined Power Turbines will process the extracted steam to the required conditions for the BECCS plant equipment and would generate electricity to be used by the Proposed Scheme. This will be the primary source of electricity for the Proposed Scheme as it maximises the extraction of energy within the steam, and so ensures impact on the biomass power generating units efficiency is minimised.

As part of the Proposed Scheme, an alternate secondary electrical supply from the 132 kV air insulated switchgear would be required to ensure uninterruptable operation of the Proposed Scheme when power from the Combined Power Turbines is not available. The connection would be made at the existing National Grid Electricity Transmission (NGET) owned 132 kV air insulated switchgear which is located in the south-eastern part of the existing Drax Power Station Site. To enable this connection, upgrade works would be required to the existing substation infrastructure at the 132 kV air insulated switchgear and possibly the adjacent 400 kV substation.

A Modification Application ('Mod App') will be submitted to National Grid Electricity Systems Operator (NG ESO), which will enable NG ESO to instruct NGET to conduct system studies to determine the exact upgrades required on both the 132 kV air insulated switchgear and 400 kV substation to enable an increase in import capacity. Following completion of the system studies, NG ESO will instruct NGET to undertake any modification works.

Drax owns the freehold interest in all of the land on which the electrical connection will be made, up to the substation. The freehold in the land on which the 132 kV air insulated switchgear and 400 kV substation is situated is owned by National Grid Electricity Transmission plc (NGET), subject to certain rights over such land that Drax has the benefit of. However, Drax requires additional rights in the land on which the substation is located to enable Drax to install and maintain the electrical connection upgrade works. These additional rights are being sought through the DCO, but Drax is also discussing these rights with NGET to seek to reach a voluntary agreement.

1. INTRODUCTION

- 1.1.1. The Grid Connection Statement has been prepared to support Drax Power Limited's (the 'Applicant') application (the 'Application') for a Development Consent Order (a 'DCO') that is made to the Planning Inspectorate ('PINS') under Section 37 of The Planning Act 2008 (as amended) (the '2008 Act') (Parliament of the United Kingdom, 2008) in respect of the Drax Bioenergy with Carbon Capture and Storage ('BECCS') project.
- 1.1.2. The Applicant is seeking a DCO to authorise the construction, operation and maintenance of new post-combustion Carbon Capture technology and associated development (together the 'Proposed Scheme') to capture carbon dioxide from up to two existing 660 megawatt electrical ('MWe') biomass power generating units at the Drax Power Station ('Unit 1' and 'Unit 2') on land within and adjacent to the existing Drax Power Station Site, Drax, near Selby, North Yorkshire, YO8 8PH, within the administrative areas of Selby District Council and North Yorkshire County Council.
- 1.1.3. The Proposed Scheme falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (a 'NSIP') under Sections 14 and 15(2) of the 2008 Act. It is therefore necessary for the Applicant to apply to the Secretary of State (the 'SoS') for the Department for Business, Energy & Industrial Strategy for 'Development Consent' for the Project under Section 31 of the 2008 Act.
- 1.1.4. In accordance with regulation 5(2)(b) of the Infrastructure Planning (Applications: Prescribed Forms and Procedures) 2009 (the 'APFP Regulations') (HM Government, 2009) and in accordance with the PINS Advice Note 6: Preparation and submission of application documents (Version 7, dated February 2016) (The Planning Inspectorate, 2016), a draft of the proposed DCO (document reference 3.1) has been submitted to the SoS as part of this Application.
- 1.1.5. The Grid Connection Statement has been prepared to comply with Regulations 5(2)(p) and 6(1)(a)(i) of the APFP Regulations, which requires the Applicant to provide a statement of who will be responsible for designing and building the connection to the National Transmission System ('NTS').
- 1.1.6. Paragraph 4.9.1 of the Overarching Energy National Policy Statement for Energy (EN-1) (Department of Energy & Climate Change, 2011) emphasises that it is for the Applicant to ensure that there will be necessary infrastructure and capacity within an existing or planned transmission or distribution network to accommodate the electricity generated.
- 1.1.7. Although as part of the Proposed Scheme, there is not a requirement to design or build a new connection to the NTS, upgrade works will be required to the existing National Grid Electricity Transmission ('NGET') owned 132 kV air insulated switchgear and possibly (and as such the DCO provides powers to do so) to the adjacent NGET owned 400 kV substation to enable an increase in import capacity to Drax Power Station.

- 1.1.8. Although NGET own the electricity transmission network, it is National Grid Electricity Systems Operator (NG ESO) who manage the electricity transmission network.
- 1.1.9. As such, a Statement of Common Ground ('SoCG') with NG ESO is being prepared and discussed between NG ESO and the Applicant to ensure both parties are in agreement of the key matters to facilitate the required upgrade works to enable an increase in import capacity to Drax Power Station. The SoCG will be progressed and submitted prior to the start of the examination.
- 1.1.10. The purpose of the Grid Connection Statement is to outline the process for increasing the import capacity of Drax Power Station and the contractual agreements that need to be in place for this to occur.
- 1.1.11. A description of the connection works is provided and the responsibility for the design and construction for the required upgrade works has been outlined within this Grid Connection Statement.
- 1.1.12. Drax owns the freehold interest in all of the land on which the electrical connection will be made, up to the substation. The freehold in the land on which the 132 kV air insulated switchgear and 400 kV substation is situated is owned by NGET, subject to certain rights over such land that Drax has the benefit of. However, Drax requires additional rights in the land on which the substation is located to enable Drax to install and maintain the electrical connection upgrade works. These additional rights are being sought through the DCO, but Drax is also discussing these rights with NGET to seek to reach a voluntary agreement.

2. PROJECT DESCRIPTION

2.1. THE APPLICANT

2.1.1. The Applicant is Drax Power Limited. Drax Power Station is owned and managed by the Applicant, who is part of the Drax Group Plc, one of the UK's largest energy producers.

2.2. THE PROPOSED SCHEME

- 2.2.1. The Proposed Scheme would involve the installation of post combustion Carbon Capture technology to capture carbon dioxide from up to two existing 660 megawatt electrical ('MWe') biomass power generating units at the Drax Power Station (Unit 1 and Unit 2). The Scheme is designed to remove approximately 95% of the carbon dioxide from the flue gas from those two units. Units 1 and 2 are located in the centre of the Drax Power Station Site (see document reference 2.5 (Indicative Plans and Elevations) for further details).
- 2.2.2. The carbon dioxide captured will undergo processing and compression before being transported via a proposed new pipeline for storage under the southern North Sea. Transport and storage infrastructure will be consented through separate applications (see further details on the transport and storage infrastructure below).
- 2.2.3. It is intended that core items of the existing infrastructure at the Drax Power Station are re-used by installing and integrating the Carbon Capture technology onto existing infrastructure including existing power generating units (units 1 and 2) for extraction of steam, re-using the cooling water systems, Main Stack and electrical connections.
- 2.2.4. The Proposed Scheme is made up of the following:
- Up to two Carbon Capture Plants (one associated with Unit 1 and one associated with Unit 2) (Work No. 1 as described in Schedule 1 of the draft DCO), each made up of:
 - Flue gas pre-treatment section;
 - One Absorber Column;
 - Solvent Regeneration System (to include up to two Regenerators);
 - Rich Solvent / Lean Solvent Heat Exchangers; and
 - Additional infrastructure and modification works to the Drax Power Station that are required to support and integrate with one or both Carbon Capture Plants including:
 - Solvent Storage and Make-up System;
 - Carbon Capture Wastewater Treatment Plant;
 - Carbon Dioxide Processing and Compression Plant;
 - Modification to the existing water pre-treatment plant;

- Modification of the existing cooling system and distribution of cooling water to the Proposed Scheme;
- Modifications to existing electrostatic precipitators;
- Modifications to existing power generating units for steam extraction and new steam processing infrastructure for distribution of process steam and electricity supply to the Proposed Scheme
- Upgrades to the existing electrical infrastructure and new electrical infrastructure for the secondary electrical supply to the Proposed Scheme;
- Infrastructure to transport compressed carbon dioxide from the Carbon Dioxide Processing and Compression Plant to storage and transport infrastructure operated by National Grid Carbon Limited. (See further details on carbon dioxide transport and permanent storage below including the NGCL Carbon Dioxide Delivery Terminal Compound at section 1.3, below.);
- Road modifications during construction;
- Additional supporting infrastructure and other works for the Proposed Scheme as set out in the ES submitted with the DCO Application (document reference 6.1.2) in Volume 1, Chapter 2.
- Temporary construction laydown areas (Drax Power Station Site Construction Laydown Areas and the East Construction Laydown Area); and
- Habitat Provision Area.

2.2.5. A full project description is included in the ES submitted with the DCO Application (document reference 6.1.2) in Volume 1, Chapter 2.

2.3. ELECTRICAL WORKS REQUIRED AS PART OF THE PROPOSED SCHEME

2.3.1. Of particular relevance to NG ESO and this Grid Connection Statement are the required upgrade works to the existing 132 kV air insulated switchgear and possible required upgrade works to the 400 kV substation, both located at the Drax Power Station Site.

2.3.2. The Proposed Scheme includes new Combined Power Turbines which will be dual purpose. The Combined Power Turbines will process the extracted steam to the required conditions for the BECCS plant equipment and would generate electricity to be used by the Proposed Scheme. This will be the primary source of electricity for the Proposed Scheme as it maximises the extraction of energy within the steam, and so ensures impact on the biomass power generating units efficiency is minimised. The Combined Power Turbines would be connected through new distribution voltage infrastructure to be constructed near the BECCS plant equipment. The new distribution voltage infrastructure would be installed by the Applicant as part of the Application.

2.3.3. As part of the Proposed Scheme, an alternate secondary electrical supply from the 132 kV air insulated switchgear would be required to ensure uninterrupted operation

of the Proposed Scheme when power from the Combined Power Turbines is not available. The connection would be made at the existing 132 kV air insulated switchgear which is located in the south-eastern part of the existing Drax Power Station Site. To enable this connection, upgrade works would be required to the existing NGET owned substation infrastructure at the 132 kV air insulated switchgear and possibly the adjacent 400 kV substation.

- 2.3.4. A Modification Application ('Mod App') will be submitted to NG ESO, which will enable NG ESO to instruct NGET to conduct system studies to determine the exact upgrades required on both the 132 kV air insulated switchgear and 400 kV substation to enable an increase in import capacity. Notwithstanding the pending conclusions from the Mod App, an outline description of the upgrade works has been included in Schedule 1 of the Order, specifically Work No. 1F(i), which covers the potential upgrade to the existing 400 kV National Grid substation, and Work No. 1F(ii) which covers the modifications and upgrade to the 132 kV air insulated switchgear including but not limited to circuit breakers, busbar disconnectors, and earth switches. The areas in which these works can be undertaken have been indicated on the Works Plans (*document reference 2.3*) under the wider Work No. 1F.
- 2.3.5. Additional electrical works as part of the Proposed Scheme would comprise of upgrades of approximately 1.5 km of existing underground and overhead line cabling and new distribution voltage infrastructure. As these would be works to assets owned and controlled by the Applicant, NG ESO do not have an interest in these works which have been outlined below for reference:
- Decommissioning and removal of existing Applicant owned oil-filled cabling, and installation of upgraded cabling as part of the connection from the 132 kV air insulated switchgear to the existing Applicant owned overhead lines. (*Works to be implemented by the Applicant. Detail included for reference, and included in Schedule 1 of the Order, specifically Work No. 1F (iii)*).
 - Destraining, upgrading and restringing of existing Applicant owned overhead lines as part of the connection from the newly installed upgraded cabling to the new distribution voltage infrastructure. (*Works to be implemented by the Applicant. Detail included for reference, and included in Schedule 1 of the Order, specifically Work No. 1F (iv)*).
- 2.3.6. The areas in which these works can be undertaken have been indicated on the Works Plans (*document reference 2.3*) under the wider Work No. 1F.

3. STATUS OF AGREEMENT WITH NG ESO

- 3.1.1. NG ESO manage the National Electricity Transmission System ('NETS') in England and Wales.
- 3.1.2. The Applicant has an existing Bilateral Connection Agreement (BCA) A/NP/90/1-9EN (5), created 18 September 2001.
- 3.1.3. In October 2021 Drax commenced discussions with NG ESO regarding the electrical supply required by BECCS plant equipment and confirmation of the ownership boundary at the 132 kV air insulated switchgear for asset condition. It was confirmed that the Applicant owns and manages the circuit breakers, bus bar disconnectors and earth switches prior to the bus bar connection and NGET owns and managed the bus bars, the 400/132 kV supergrid transformers, associated cabling and telemetry.
- 3.1.4. In December 2021 National Grid provided a response to the Section 42 Planning Act 2008: Statutory Consultation. No comments were raised at this stage and no reference was made to the upgrades works required at the 132 kV air insulated switchgear.
- 3.1.5. In April 2022, the Applicant submitted a draft SoCG together with a draft description of the works and drawing of the works areas to be consented under the Order to NG ESO for review, and discussion to assist the progression of matters between the parties. It is anticipated that the SoCG will be progressed and submitted prior to the start of the examination.
- 3.1.6. At the time of writing, it is envisaged that in Q2 / Q3 2022, the Applicant will submit a Mod App as submission of Drax Power Station's existing Date Registration Code Schedules to the existing BCA to enable NG ESO to instruct NGET to conduct system studies to determine the extent of the upgrade works on both the 132 kV air insulated switchgear and 400 kV substation. Following the completion of these studies after approximately three months, NG ESO will provide a contract offer to the Applicant which will dictate which works, classified as 'User Works', the Applicant would have to complete under the Order.
- 3.1.7. Following the Applicant's acceptance of the offer, the Applicant will submit an application for an Agreement to Vary ('ATV') its existing BCA A/NP/90/1-9EN (5) of 18 September 2001 (as amended from time to time). The ATV to the existing BCA will provide the Applicant with an increased import capacity from the NETS. The Applicant has the intention to sign and enter into the ATV prior to commencement of the civil works for the Proposed Scheme (currently programme for Q1 2024). At this point, the Applicant will also enter into a construction agreement and related documentation with NGET to carry out the works defined in the Proposed Scheme to enable connection to the NETS.)
- 3.1.8. If the DCO is confirmed by the SoS, the Applicant will construct, operate and maintain the electrical connection upgrade works as are required and included in the Order.

4. RESPONSIBILITY FOR DESIGNING AND BUILDING THE ELECTRICAL CONNECTION UPGRADE WORKS

- 4.1.1. As set out in Sections 1 and 2, the electrical connection upgrade works will comprise of modifications and upgrades to the existing 132 kV air insulated switchgear and possibly the existing 400 kV substation required to enable an increase in import capacity at Drax Power Station. At present, the design, installation, operation and maintenance of the works is the responsibility of the Applicant (part of Work No. 1F within the Order).
- 4.1.2. Any work undertaken within the 132 kV air insulated switchgear will need to be carried out under National Grid safety rules and by National Grid approved contractors.
- 4.1.3. NG ESO will have involvement in the overall design process until completion of the commissioning works.

5. ACQUISITION OF LAND AND RIGHTS REQUIRED TO BUILD THE ELECTRICAL CONNECTION UPGRADE WORKS

- 5.1.1. The Applicant owns the freehold interest in the Drax Power Station Site on which the electrical connection upgrade works (Installation of upgraded cabling and restringing of existing overhead lines), up to the 132 kV air insulated switchgear, would be made.
- 5.1.2. The freehold in the land on which the 132 kV air insulated switchgear and 400 kV substation are situated is owned by NGET, subject to certain rights over such land that the Applicant has the benefit of. However, the Applicant requires additional rights in the land on which the 132 kV air insulated switchgear and 400 kV substation are located to enable the Applicant to install and maintain the connection. These additional rights are being sought through the DCO, but the Applicant is also discussing these rights with NGET to seek to reach a voluntary agreement.
- 5.1.3. Work Number 1F in Schedule 1 of the Order covers the connection works up to the 132 kV air insulated switchgear and the upgrade works to the 132 kV air insulated switchgear and 400 KV substation.

6. CONSENTING OF THE ELECTRICAL CONNECTION UPGRADE WORKS

- 6.1.1. The upgrade works forms part of the works included within the DCO Application, and therefore no separate planning permission is required.
- 6.1.2. Part 1 of Schedule 1 of the Order describes the works for which Development Consent is being sought. Work No. 1F – Electrical Connections comprise the upgrade works. These are as follows:
- Work No. 1F(i) – upgrade to the existing 400 kV National Grid substation; and
 - Work No. 1F(ii) – modifications and upgrade to the 132 kV air insulated switchgear including but not limited to
 - Circuit breakers;
 - Busbar disconnectors; and
 - Earth switches.
- 6.1.3. Article 6 of the draft DCO ('Benefit of Order'), provides that the benefit of the Order is solely for the benefit of the undertaker (subject to the ability to transfer it under article 7 ('Consent to transfer benefit of Order'), but also provides that both the undertaker and NGET have the benefit of the Order in relation to Work No. 1F. The exercise by NGET of any benefits or rights conferred in this way would be subject to all relevant restrictions, liabilities and obligations under the Order. In addition, the undertaker can transfer the benefit of the Order under article 7, and if the grantee or transferee is a statutory undertaker (i.e., in this case a person who holds a licence under Section 6 of the Electricity Act 1989 such as NGET), the consent of the SoS would not be required for the transfer. NGET holds a licence under Section 6 of the 1989 Act.
- 6.1.4. Drax therefore considers that, if the DCO is made in substantively the same terms as those set out in the Order development consent for the upgrade works will have been secured.

7. CONCLUSION

7.1.1. This Grid Connection Statement has demonstrated that:

- There is no reason why the electrical connection upgrade works would not be possible for the Proposed Scheme.
- The electrical connection upgrade works forms part of the works included within the draft DCO Application and has been assessed as part of the individual discipline chapters of the Environmental Statement submitted as part of the DCO Application.
- The electrical connection upgrade works are technically feasible, and it is concluded in the ES that it will be unlikely that there will be any significant environmental effects as a result of the electrical connection upgrade works.
- The necessary contractual agreement is being secured for the Proposed Scheme to increase the import capacity at the Drax Power Station Site with NG ESO through a Mod App and subsequent ATV to Drax's existing BCA A/NP/90/1-9EN(5) of 18 September 2001. A construction agreement and related documentation will be concluded between the Applicant and NG ESO at the same time as the ATV which will secure the design and build of the electrical connection upgrade works for the Proposed Scheme.

REFERENCES

Department of Energy & Climate Change. (2011). Overarching National Policy Statement for Energy (EN-1).

HM Government. (2009). The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations.

Parliament of the United Kingdom. (2008). The Planning Act (as amended).

The Planning Inspectorate . (2016, February). The Planning Inspectorate Advice Note 6: Preparation and submission of application documents (Version 7).