**Public**

Ref: FOI/24/0042

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15/04/2025

Dear requester

**Request for Information**

Thank you for your request for information which was received on 17 February 2025 and identified as being within the scope of the Freedom of Information Act 2000 (FOIA) and Environmental Information Regulations 2004 (EIR).

We wrote to you on 24 February to advise that we would manage your request under the FOIA and/or EIR and also to request clarification on your request. You responded on 14 March 2025.

**Our response**

You have requested information relating to:

- the methodology for the Cost Benefit Analysis (CBA) developed to identify suitable projects for competition, and
- detailed information on the completed CBA for the WCN2 project, a new circuit between south-west Scotland and north-west England.

Organisations subject to the FOIA and EIR are required to confirm whether information that meets the scope of a request is held and to disclose that information, unless an exemption (FOIA) or exception (EIR) applies. The information must be 'recorded' and held by the organisation at the date of the request. There is no obligation to create new information to respond to a request. Responses and disclosures under the FOIA and EIR are considered to be disclosures into the public domain and not just disclosures to the specific requester.

For information:

- Questions 1, 8 and 10 have been considered under the Freedom of Information Act 2000 (FOIA).

- The exemption at Section 39 of the Freedom of Information Act 2000 (FOIA) covers information that a public body is obliged to consider under the EIR and has the effect of routing all requests for environmental information via the EIR rather than the FOIA.
- We have determined that the information requested in questions 2–7, 9 and 10 meets the definition of 'environmental information' at Regulation 2(1) of the Environmental Information Regulations 2004 (EIR) and these questions have therefore been considered under that legislation.

We confirm that we hold recorded information in scope of your request and provide our response to each of your questions below.

***1.We request the NESO's position on the grounds on which they have refused to provide the Cost Benefit Analysis data…***

We understand this question to be for recorded information relating to NESO's reasons for not providing the details of the completed Cost Benefit Assessment (CBA) for WCN2. We note that previous requests for the CBA have not been managed under either the FOIA or the EIR.

NESO wrote to Ofgem on 14 March, the date on which you responded to our request for clarification, explaining our decision not to disclose the CBA to Transmission Owners (TOs)and other parties. This information was therefore held by NESO at the date of your request, and we enclose a redacted copy of the letter.

Section 40(2) of the FOIA provides an exemption for information where disclosure would breach any of the principles in the UK General Data Protection Regulations (GDPR). We have determined that the disclosure of individuals' personal data would be in contravention of principle (a) of the UK GDPR as such processing would not be lawful, fair or transparent. We are unable to identify a lawful basis for the processing of this personal data and do not believe that individuals would expect their personal data to be made publicly available in this manner. Although we recognise that any harm or distress caused by the disclosure would likely be very limited, we do not believe that there is a legitimate public interest in disclosure. We have therefore redacted personal data from the document.

***2.We request full transparency and access to all inputs and outputs of the NESOs CBA.***

We can confirm that we hold the completed CBA for WCN2. The cost information used in the CBA methodology was provided to NESO by the Transmission Owners (TOs) as part of the "Beyond 2030" network plan (also known as the transitional Centralised Strategic Network Plan 2 (tCSNP2)) submission. However, that cost information covers the entire WCN2 project, including the non-competed elements. To identify the costs associated with the proposed competed elements of WCN2, NESO conducted its own cost estimation exercise, supported by the NESO's consultants and advisors and it is this data that is held within the completed CBA. Both the data from Transmission Owners (TOs) and the data from other parties was provided to NESO on the basis that the information was confidential and with an expectation of confidentiality. NESO does not

have the consent of the third parties to disclose this information. The TO data was provided under the System Operator Transmission Owner Code (STC) which includes obligations of confidentiality (Section F): .STC Code Documents | National Energy System Operator.

The letter sent to Ofgem and disclosed in response to question 1 explains NESO's position on sharing the completed CBA for WCN2.

There is a presumption of disclosure under the EIR, unless the class of information or the likely impact of disclosure to the public means that an exception applies. In responding to your request, we have therefore considered the disclosure of this information in line with the requirements of this legislation.

Regulation 12(5)(e) states that a public authority may refuse to disclose information to the extent that its disclosure would adversely affect the confidentiality of commercial or industrial information where such confidentiality is provided by law to protect a legitimate economic interest.

In our opinion, disclosure would breach the confidentiality obligations under the STC which NESO is required to comply with under section E4 of the Electricity System Operator licence and section 105 of the Utilities Act.

Legitimate economic interests include ensuring that competitors do not gain access to commercially valuable information thereby gaining a competitive advantage, and the protection of a commercial bargaining position in the context of existing or future negotiations. Disclosure of the completed CBA would make detailed cost information and commercial assumptions for the WCN2 project publicly available. Although this information would theoretically be available to all potential bidders and the TOs, it could not be guaranteed that all potential bidders would have access therefore it is possible that some bidders could gain an unfair advantage.

All EIR exceptions are subject to a public interest test.

The introduction of competition to onshore electricity networks has a key role to play in improving efficiency in network investment, driving innovative solutions to network needs, and helping decarbonisation targets to be met at the lowest cost to consumers. Making the complete CBA publicly available will affect the competition element of network development for this project, by enabling bidders to identify the estimated costs and submit bids on those grounds alone. This will subsequently impact the potential savings for consumers. Those savings have been estimated by Government to be up to £1 billion by 2050 on projects tendered over the next 10 years.

NESO recognises that there is a general public interest in transparency. There is also a public interest in sharing information where it helps to explain the decision-making process and the basis for decisions made by public sector bodies. There is a public interest in providing

information relating to new processes which impact on public infrastructure so that businesses and members of the public can better understand the processes and outcomes.

It is in the public interest that NESO is able to protect such procurement exercises, follow procurement law and procedures, in order to carry out a fair early competition procurement, not disadvantage potential market participants, and realise the benefits that competition would bring.

The Information Commissioner has acknowledged that there is some inherent public interest in maintaining commercial confidences and that third parties would be discouraged from confiding in public authorities if they did not have some assurances that confidences would be respected. In order to fulfil our statutory and licence obligations as the independent system operator and planner under the Energy Act 2023, we must remain independent, fair, and consumer focused.

Disclosure would breach the STC and would be likely to harm the relationship between NESO and the TOs and would be likely to reduce trust in NESO more widely in the energy sector. If suppliers of information are concerned about the disclosure of the information, and feel that they cannot trust NESO, such that they are unwilling to provide information in the future, this would be likely to have a detrimental effect on NESO's ability to carry out our role, which would not be in the public interest.

On balance we believe that the public interest lies in maintaining this exception and refusing the disclosure of the detailed cost and commercial information and assumptions.

The CBA methodology addresses one of the criteria for identifying projects for early competition, allowing cost benefit assessment on a project-by-project basis so that recommendations can be made to Ofgem. The CBA methodology document includes key assumptions, a list of inputs, how revenue and cost build-up would be treated, how counterfactuals would be identified, and how we had benchmarked different elements of the CBA used in the Early Competition CBA model: Early Competition Plan - CBA - Methodology (February 2024)

You may also be interested in this document: Early Competition Plan - CBA - Responses to consultation & summary of updates to methodology (February 2024)

A briefing note on the CBA analysis provided to Ofgem as part of the NESO's assessment of the southern section of WCN2 as a qualifying project is publicly available on the Ofgem website: NESO briefing note on the Cost Benefit Analysis.

***- 2a. Providing time stamps for both counterfactual and factual data to ensure fairness, consistency and ultimately ensuring value for consumers***

To identify the costs associated with the proposed competed elements of WCN2, NESO conducted its own cost estimation exercise, supported by consultants and advisors. The data included in the

CBA was provided by a third party. We can confirm that the model was run on 30.05.2024 and used 2024 costings. We have clear guidance and procedures to ensure that when we run the CBA, the factual and counterfactual are like for like comparisons.

***3.We request full transparency and access to all inputs and outputs to the NESO's qualitative assessments including but not limited to programme risks and costs:***

The CBA includes a qualitative assessment, and we understand your request to pertain to that assessment. A summary is provided in the NESO briefing note on the Cost Benefit Analysis.. Please also see information provided in response to question 2, particularly the Early Competition Plan - CBA - Methodology (February 2024) and further information provided below.

***- 3a. Project delays caused by the introduction of the new tender process***
***- 3b. Associated with the connecting customers reliant on WCN2.***

Please see attached a copy of the Feasibility Report. Please note that although this document is marked as "draft", it was the final version.

***- 3c. Associated with the development and operation a CATO of last resort process***

The development and operation of a CATO of last resort process is not included within the CBA.

***- 3d. Following a full impact assessment of potential resilience risks associated with WCN2 being on the Main Integrated Transmission System and crossing a MITS boundary***

An assessment of these resilience risks is not included within the CBA.

***- 3e. Associated with CATO interaction with outage planning***

Please see responses above. The CBA allows for delay and purposefully does not look at multiple causes of delay.

***- 3f. Associated with societal benefits including job creation, GSP impact and economic growth***

This information is not held as it was not considered within the CBA.

For information, please note that Ofgem has published an Impact Assessment on developing arrangements to allow for early competition to be applied to future projects on the onshore electricity transmission network. This is an assessment of the impact of Early Competition as a whole, as opposed to the CBA that has been developed to identify projects suitable for Early Competition.

***4.We request transparency and access to all assumptions alongside the methodology used to set assumptions made in the CBA.***

The CBA methodology document includes information on the assumptions used in the Early Competition CBA model: Early Competition Plan - Cost Benefit Assessment Methodology (February 2024)

***5.We request full transparency and access to the data sets and methodologies used to determine these assumptions and estimates.***

Please see Appendix 3 of the Early Competition CBA model: Early Competition Plan - Cost Benefit Assessment Methodology (February 2024) which provides information on the benchmarks used.

***6.We request justification from the NESO's understanding of statement relating to Dumfries North***
***– you confirmed that this question relates to two statements:***

- ***The NESO confirmed Monday 3rd February 2025 its understanding that only the WCN2 circuits are currently planned to be connected at 400kV to Dumfries North this is not factually correct; and***
- ***Whether the NESO believed this was a 'locked in' design***

NESO holds a briefing note 'Explanation of the substation scope for the competed elements of WCN2.', a copy of which is included in our response. The briefing note states 'Dumfries North will be energised to 400kV solely via the WCN2 circuits.' It does not state that only WCN2 circuits will be connected at 400kV to Dumfries North.

NESO does not hold information on the design being 'locked-in'. Information is not held because we do not believe that the design is 'locked in'. We are specifying a need to connect HV Transmission line between two points that included a spur off to a substation based on information provided in the beyond 2030 refresh. NESO is agnostic to the design as it will be the responsibility of the bidders meet the network need.

***7.We request further information on how the NESO has considered the above impact in their assessment alongside the costs associated with this.***
***- you clarified this request was for recorded information held on the impact of including Dumfries North and how this was considered.***

Please see the briefing note 'Explanation of the substation scope for the competed elements of WCN2'

***8.We've outlined our response to NESO's rationale for inclusion of Dumfries North in a table in Appendix 1 and ask for the NESO to provide a response to our feedback including the concerns raised above on the NESO's stakeholder and customer engagement process and the weight***

***given to potential bidder's feedback.***

This question appears to be asking for NESO to provide a written response to feedback. We do not consider this question to be for recorded information held at the time of the request and it is therefore out of scope of the information rights legislation.

***9. We request further information on the NESO's recommendation regarding the design being 'locked in'***

Please see response to question 6.

***10. We request the NESO's process for Freedom of Information requests'***

Information on NESO's management of FOIA and EIR requests is available here: Freedom of Information and Environmental Information Regulations | National Energy System Operator.
This concludes our response to your request.

**Advice and assistance**

There is further information about Early Competition on the NESO website: Early competition | National Energy System Operator.

**Next steps**

You can ask us to review our response. If you want us to carry out a review, please let us know within 40 working days and quote the reference number at the top of this letter.

If you are still dissatisfied after our internal review, you can complain to the Information Commissioner's Office (ICO). You should make complaints to the ICO within six weeks of receiving the outcome of an internal review. The easiest way to lodge a complaint is through their website: www.ico.org.uk/foicomplaints. Alternatively, they can be contacted at: Wycliffe House, Water Lane, Wilmslow, SK9 5AF.

Thank you for your interest in the work of the National Energy System Operator (NESO).

Regards,

The Information Rights Team, National Energy System Operator (NESO)

Confidential

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14 March 2025

Dear [redacted]

**Publication of the complete Cost Benefit Analysis undertaken for Early Competition**

We have received a request from [redacted] to provide them with the complete Cost Benefit Assessment (CBA[1]) undertaken to identify the first project for Early Competition. We understand that [redacted] has also raised this with Ofgem and you have now asked us to respond to these requests. After careful consideration, we have concluded that we are unable to share the CBA with the TOs and other parties and we set out our reasons below.

**Legal issues**

Firstly, we are prevented from sharing the CBA [redacted] by law: to provide this information would expose NESO to potential legal challenges.

***Procurement principles***

In designing the Early Competition process, NESO is obliged to have regard to the general principles of procurement, including, in particular, transparency and fairness. The principle of fairness means that NESO must ensure the promotion of fair and equitable treatment of potential bidders. In providing [redacted] with the complete CBA, we would be giving them an unfair advantage over other potential bidders. This is because the information contained in the CBA includes detailed cost information and commercial assumptions for a project that cannot be made available to all bidders.

[1] The CBA has been developed and used by NESO's Network Competition function to select viable projects that have the potential to be competed under Early Competition for onshore high voltage network transmission. The model has been designed to ascertain the factual and counterfactual cost comparison for individual projects and has been used a part of the assessment that has informed NESO's request from Ofgem to compete the requested project.

***Confidentiality and competition law***

In addition to providing an unfair advantage over other potential bidders, providing [redacted] with the complete CBA would also breach our obligations as regards confidentiality and, in turn, the competition law principles regarding the sharing of commercially and competitively sensitive information. The model includes confidential information from investors and other third-party data and financial forecasts that we are not permitted to publish. For this reason, we cannot publish the full CBA for the TOs and all other potential bidders to see.

We have, however, sought to be as transparent as possible whilst remaining within the confines of the law. In November 2022 the Electricity Systems Operator (ESO, now NESO) consulted on the CBA methodology. This allowed the industry the opportunity to provide its views, and submissions were received from all three incumbent TOs. ESO then further refined the Early Competition process and included the updated CBA methodology in its EC-I Update in February 2024. This update contained key assumptions, a list of inputs, how revenue and cost build-up would be treated, how counterfactuals would be identified, and how we had benchmarked different elements of the CBA. We therefore believe [redacted] have all the information regarding the CBA they need (and have been advised that what they have is sufficient to allow any expert in project and financial planning to create their own CBA model).

**Commercial issues**

In support of the legal reasons given above, there are several commercial reasons why we cannot share the full CBA. Firstly, we are aware that not all TOs are supportive of Early Competition. Whilst we are confident in the CBA and our methodology, we understand that the TOs may still try to dispute elements of the model or propose alternatives. Not only would this undermine the purpose of the consultation, it would also cause significant delay. Any such delay would impact upon the delivery of the project and have the potential to deter other bidders from entering the market.

Secondly, were we to share the complete CBA to all potential bidders, this would expose us to the possibility of a 'race to the bottom' on cost. This would obviously not be in the best interests of the consumer and could pose issues for Ofgem should they issue a CATO licence.

Finally, it is our intention to use bidder information from the first procurement to update the CBA. If we provide the complete CBA [redacted], they may expect the same in the future. This would hamper NESO's ability to independently assess future bids on behalf of Ofgem.

In conclusion, for the legal and commercial reasons above, we see no legitimate reason for [redacted] to be provided with the complete CBA. Whilst we would consider any Freedom of Information requests [redacted] on a case-by-case basis, given the legal prohibitions, we think it unlikely that that we would be able to disclose this information in the near future.

We hope the above is clear and provides you with enough information to understand our decision.

Confidential

Yours faithfully

[redacted]

Network Competition Senior Delivery Manager

[redacted]

AECOM

# Early Competition Feasibility Assessment

## WCN-2, New Cumnock to Carlisle 400kV Double Circuit

National Grid Electricity System Operator Ltd

Project number: [redacted]

18 August 2024

National Grid Electricity System Operator
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**DRAFT**

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## Quality information

| Prepared by | Checked by | Verified by |
|---|---|---|
| [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] |
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## Revision History

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# 1. Introduction

As part of the proposals to introduce early competition into the development, construction and operation of electricity transmission network infrastructure, National Grid Electricity System Operator (hereafter referred to as 'ESO') is undertaking studies to evaluate potential projects which could be eligible for competition. The study considers a range of factors with AECOM providing technical advice with respect to constructability and consentability factors. The report sets out the findings of AECOM's preliminary evaluation of the WCN-2 scheme selected as part of the shortlisting study performed at an earlier stage. The objective of this report is to provide a high-level description of the scope and the programme, as well as to identify any major risks and constraints for the project.

The optimal delivery date for the scheme is 2037.

# 2. Executive Summary

The delivery programme and potential risks for the connections between New Cumnock and Carlisle 400kV substations via Glenmuckloch, Dumfries North and Wyseby Hill substations have been assessed within this report. These connections have been proposed to be via overhead lines given the large distance between sites, resulting in a preliminary route shown in this report which avoids environmental and other consenting constraints that could affect buildability.

However, other risks, such as land procurement, material and resource availability, or adverse findings during construction may affect the constructability of the project and are discussed within the report. It is believed that, if planned in advance, the major risks can be mitigated and the project can be built within the proposed programme.

The resulting route is expected to measure approximately 132km, which will lead to a long period of work regarding overhead lines and thus extending the overall programme. Several sub-options are also presented which are to be analysed in further detail at the design stage to find the optimal route.

Regarding the delivery programme for the scheme, it has been estimated that the earliest in service date would be in 2036, potentially 2037 if some more significant construction risks are realised or delays in other schemes/TO projects affect WCN-2. This date is in line with the optimal delivery date of 2037. However, there has been consideration for possible setbacks during the construction phase, such as undesirable findings during the surveys or construction, or issues with land procurement, which cannot be confirmed at this stage. Therefore, there is a possibility for the project to be completed before the estimated date.

# 3. Project Overview

The WCN2 scheme consists of a proposed 400kV double circuit which runs from Kilmarnock South to a new substation in the Carlisle area. This involves several sections and connections into new and current substations:

- The existing 275kV route from Kilmarnock South to Killoch (which is near the existing Coylton 275kV substation) to New Cumnock would be reused and upgraded to 400kV. This section is not part of the feasibility study within this report since it would not be competed.
- A new 400kV substation named New Cumnock is to be built, driven by the requirement of 5 customer connections. The location of this substation is not confirmed, and for the purpose of this study, an estimated feasible location is determined near the existing 275kV New Cumnock.
- New Cumnock is then connected via a double 400kV OHL circuit with the new Glenmuckloch substation, the construction of which does not form part of this scheme. The connections will be into bays that are to be delivered by Scottish Power Transmission (SPT).

- A new 400kV substation named Dumfries North is to be connected to Glenmuckloch. The location of this new site is still to be confirmed, although a reasonable position is chosen for this assessment.
- The 400kV network is then connected from Dumfries North to Wyseby Hill, which is also a new substation. This site will be delivered by the Transmission Operator (TO) and the substation is therefore not part of this assessment, although the OHL connections will be.
- Lastly, the WCN-2 route terminates in the Carlisle 400kV substation, which is to be delivered by NGET.

The diagram below shows the new circuit and substations proposed in this scheme highlighted green, whereas the existing/non-competed substations are shown with blue squares:

**Figure 1: New Connection Diagram**

# 4. Engineering scope

The engineering works considered for competition would be as follows:

- New 400kV substation at New Cumnock:
  - The new substation will have a double-busbar arrangement with two bus-section and two bus-couplers. It will consist of nine bays, as shown in the SLD in Figure 3. Four of these bays will be transformer bays (750MVA each), four of them will be used for the connection of WCN-2 (two to Killoch and two to Glenmuckloch) and the last bay is expected to be used for customer connection.
  - The 275kV side of the SGTs would be delivered and owned by SPT. It has been assumed that the ownership border will be the connection end of the SGT 275kV isolator.
  - The location of this new site is currently unknown, and for the purposes of this assessment, an estimated feasible location is determined near the existing 275kV New Cumnock, as seen in Section 5.
- 400kV double circuit OHL section from New Cumnock to Glenmuckloch:
  - All four new bays at Glenmuckloch 400kV required for WCN-2 would be delivered by SPT and are not subject to competition.
  - The location of Glenmuckloch can be found here.
  - 400kV double circuit OHL section from Glenmuckloch to Dumfries North:
- New 400kV substation at Dumfries North:
  - The proposed arrangement of this substation is shown in the SLD in Figure 4. It consists of four bays used for the WCN-2 connections, along with a provision for a 360MVA SGT for a customer connection.
  - The LV side of the SGT can be considered customer asset. It has been assumed that the ownership border will be connection end of the SGT 275kV isolator.
  - The location of this substation would be subject to the bidder's proposal with the potential location is identified as part of this study, as far as can be reasonably expected at desktop level analysis.
- 400kV OHL section from Dumfries North to a new substation at Wyseby Hill:
  - The Wyseby Hill substation build would be delivered by the incumbent TO and not subject to competition.
  - The location of Wyseby Hill is not yet known, but it is expected to be somewhere between Lockerbie and Gretna Green in close proximity to the existing 400kV ZV route to enable a turn in into the new substation.
- 400kV OHL section from Wyseby Hill to a substation in the vicinity of Carlisle
  - The Carlisle substation build would be delivered by the incumbent TO and not subject to competition.
  - The Carlisle substation is the replacement for Harker substation, currently in development.
  - Two new bays at Carlisle 400kV for the connection of WCN-2 would be delivered by the incumbent TO and are not subject to competition.

The proposed SLD for the whole scheme is shown in the figure below:

**Figure 2: Proposed SLD for WCN-2**

# 4.1 Substations

All substation works associated with Glenmuckloch, Wyseby Hill and Carlisle 400kV works are excluded from Early Competition and will be part of other projects run by the incumbent TOs. However, in order to understand the amount of work required for this scheme, an assumption was made that those (built by TO) will be standard double busbar substations with enough spare bays to facilitate the WCN-2 new OHL connections.

Regarding the WCN-2 scheme, two new substation builds are included in the scope: New Cumnock and Dumfries North, which consist of nine and five bays, respectively, both with a double busbar configuration.

The arrangement of these sites may change at a later date to include more bays to accommodate future connections. For now, it is assumed that the configurations in the SLD will be carried out as part of this scheme.

## 4.1.1 Existing Arrangement

The WCN-2 scheme will connect together five new 400kV substations via a new double-circuit OHL. None of those new substations currently exist, and while the details for the proposed New Cumnock and Dumfries North substations are available, details for new Glenmuckloch, Wyseby Hill and Carlisle substations planned to be delivered by the TO are not.

## 4.1.2 Assumptions

Given the early stages of this scheme, several assumptions were necessary to carry out the feasibility assessment for WCN-2:

- Regarding the geographical position of the new substations, the following locations have been assumed since the final location is not yet known:
    - The new 400kV Glenmuckloch will be constructed by the incumbent TO north of Kirkconnel village, across the railway and A76 (approximate co-ordinates are 55°24'21.05"N / 4° 2'12.73"W)

  - The new Dumfries North 400kV to be built north from Dumfries village. The environment section of this report based on mathematical constraint optimisation indicates the possible location for the substation (55° 5'35.07"N / 3°36'44.57"W). However, the location may change after the more detailed investigation.
  - The new New Cumnock 400kV substation to be built next to existing 275kV New Cumnock substation.

- It has been assumed that Wyseby Hill 400kV, Carlisle 400kV and Glenmuckloch 400kV substations will be constructed by the incumbent TOs concurrently as the WCN-2 construction works. A delay in the works carried out by these TOs are not considered in this assessment and is not reflected in the programme. Glenmuckloch 400kV will be energised via the new WCN-2 OHL once built, whereas Wyseby Hill and Carlisle 400kV substations are believed to be energised via another circuit.
- It has been assumed that Wyseby Hill and Carlisle 400kV substations will have dedicated bays to accommodate WCN-2 OHL and all associated equipment.
- No provision for reactive compensation or power flow management equipment has been made. However, a more detailed study would be required at the design stage to determine if any equipment is necessary.
- It has been assumed that all necessary outages (if required) at Glenmuckloch, Wyseby Hill and Carlisle 400kV substations will be available within a sensible timescale.
- It is assumed that, given the high demand within the area during the colder months, the outages necessary for the connections will be restricted to the summertime. It is also considered unlikely that ESO would be able to provide simultaneous outages on any sites, and thus single busbar or single circuit outages (if required) will be used to facilitate construction activities.
- It is assumed that the substations built within this scheme will be constructed off-line and energised via WCN-2 OHLs.
- It has been assumed that the incumbent TO will upgrade the existing 275kV OHL between Kilmarnock and New Cumnock 275kV substation to 400kV. As a result of this upgrade, the 275kV connection from Kilmarnock becomes redundant. However, as a the 275kV network within this area needs to be kept operational, it is assumed that the existing 275kV network to the New Cumnock 400kV substation (built by the Contractor) will be connected via four interbus SGTs, with the existing 275kV New Cumnock substations becoming redundant or reconfigured.
- The incumbent TO is assumed to be responsible for all the circuit transfers between the existing 275kV and the new 400kV New Cumnock substations, while the substation construction contractor is responsible for providing the necessary 400kV bays for the Kilmarnock upgrades, involving a double circuit and four bays for the interbus SGTs at the new 400kV station.
- It is assumed that the 400kV New Cumnock substation will be energised via the Glenmuckloch circuit, with the new 400kV circuit from Kilmarnock and 275kV SGT tails to be connected by the incumbent TO at a later stage.
- All equipment designed, built and commissioned as part of SPT projects are to follow SPT standards, specifications and procedures. Similarly, works being carried out for the Carlisle 400kV substations are to comply with NGET standards.
- As the System Design Specification (SDS) is not available, it has been assumed that the whole substation equipment will be rated to operate at 3600MVA power flow per circuit, with availability to run split and in parallel.
- The new substations part of this scheme are assumed to be AIS given the large areas of land around the assumed substation locations. However, if these sites were to be GIS, no major changes are expected regarding this assessment and the scheme’s programme.
- It has been assumed that SF6-free 400kV equipment will be available at the time of construction if required, or at least provisions are assumed to be made for an easy upgrade to SF6-free equipment.

### 4.1.3 Works Description

#### New Cumnock 400kV

The New Cumnock 400kV substation shall be built as close as possible to the existing 275kV New Cumnock substation, thus reducing the connection corridor between both sites, which will be done via interbus SGTs.

The New Cumnock 400kV substation will consist of a double bus-bar standard arrangement with 9 bays, with a provision to allow for further extension if required. Four of these bays will be used for the WCN-2 circuit, another four are used for the interbus SGTs, and lastly one connection is used for the customer connection.

Regarding other HV equipment necessary, New Cumnock 400kV will have two bus sections, along with two bus couplers. Please refer to Figure 3 for the SLD of this substation.

The New Cumnock 400kV substation, along with the 400kV switchgear, shall include all associated switchgear and auxiliary buildings, secondary systems, access roads etc. The contractor shall design, procure, construct and commission all the new equipment.

The contractor shall also supply, install and cold commission four 400/275kV, 750MVA SGTs to facilitate interconnection between the 400kV and 275kV New Cumnock rafts, as well all 275kV equipment to the point the bar/cable/GIL leading to 275kV raft is connected to.

**Figure 3: New Cumnock 400kV SLD**

## Dumfries North 400kV

Similar to New Cumnock substation, the new Dumfries North 400kV substation will also be a standard double busbar arrangement, in this case with five bays: four for OHL connections to Glenmuckloch and Wyseby Hill and one 360MVA SGT bay for customer connection. In addition, it will have one bus section and one bus coupler.

The New Cumnock 400kV substation, along with the 400kV switchgear, shall include all associated switchgear and auxiliary buildings, secondary systems, access roads etc. The contractor shall design, procure, construct and commission all the new equipment.

The contractor shall also supply, install and commission one 400/132kV 360MVA SGT to facilitate customer connection, as well as providing all necessary 132kV equipment to the point the bar/cable/GIL leading to 132kV customer switchgear.

**Figure 4: Dumfries North 400kV SLD**

### 4.1.4 Risks, Constraints and Opportunities

Given the remote location of the sites within this scheme, transport and access of the necessary equipment and machinery for the construction of the substations and the installation of the HV equipment may cause a challenge due to the characteristics of the roads within the area. This may lead to the closing of certain roads, permission for which may extend the substation programme. However, compared to the consent risks required for the OHL programme (which will be discussed in future sections), the substation related constraints are considered minor and would not put the end scheme delivery date at risk.

ESO or the relevant TO may bring forward the agreed outage dates and access requirements at any time in short notice. The construction contractor's schedule should include contingency for such events, and the overall programme shall be able to accommodate those risks.

The main risk for the project is to obtain the consent for the new builds. Any delays with the consent may significantly impact the programme and the end delivery date.

The unknown location of the customer planning to connect to Dumfries North 400kV may also have impact on the new substation location as the new site should be within a sensible distance from the customer plant.

SF6-free equipment may be not available at the start of the construction works. However, as mentioned previously, provision for the installation of SF6-free equipment in the future should be considered during the design process.

As the power and operations flexibility studies have not been carried out, there is a risk that the New Cumnock and Dumfries North substations may require additional modifications, such as bay location re-arrangement or addition of reactive power control devices. This risk is to be discussed with the TO at earliest opportunity.

There is a possibility that the incumbent TO will start upgrading the existing 275kV OHL between Kilmarnock and New Cumnock substations to 400kV before the new WCN-2 400 kV OHL to Glenmuckloch 400kV substation is fully operational but the new 400kV New Cumnock substation is built and cold commissioned by the contractor. In that case multiple outages would be required as well as close mutual co-operation between the TO and the contractor to facilitate the 275kV circuit transfer to the 400kV New Cumnock substation.

As the locations and layouts for the substations being carried out by the TOs are unknown at this stage, there is a risk that the orientation and location of New Cumnock and Dumfries North 40kV substations may change to avoid difficult OHL crossings. This should be studied in detail once more information becomes available.

Lastly, due to the long SGT procurement lead time (up to 48 months), it is recommended to initiate the procurement process as soon as possible to avoid any delays.

### 4.1.5 Programme and Outages

If the New Cumnock 400kV substation is to be energised from the Carlisle end, no dedicated outages are expected to be required.

The overall programme for substation design and construction is estimated to be:

- 12-18 months to design the new substations and reach an agreement with NGET.
- Procurement from 12 to 48 months. The longest lead time would be for GIS (if necessary) and the interbus transformers.
- Two-year long construction period for both substation works.

In summary, a 4-5 year programme for substation works is required from the date the contract is awarded. This is a conservative estimation, and it is believed that it could be reduced if necessary. However, it does not pose risk to the overall scheme delivery date since the OHL works, considered in the following section, will be the limiting factor regarding the energization of the connection.

### 4.1.6 Summary

Despite the precise location of the new substations not being known yet, the related works for New Cumnock and Dumfries North 400kV do not contain any major risks or difficulties. The substations will be built to SPT standards using Type registered equipment and the bays will be SPT standard bay solutions.

Once building permissions have been granted, no major time-consuming risks are expected for these substation works, thus it can be assumed with great confidence that the substation works will be completed before the OHL are commissioned to service.

## 4.2 OHL

### 4.2.1 Assumptions and Limitations

In line with the National Policy Statement (NPS) EN-1, it is assumed that the majority, if not all, of the connection between New Cumnock 400kV substation and the Carlisle 400kV substation via Glenmuckloch, Dumfries North and Wyseby Hill will be made via overhead lines due to the long distances between each site. Given the locations of the substations, challenges may arise in routeing the OHLs to avoid parks, protected environments and some settlements such as Longtown, Gretna or Dumfries . These possible constraints are discussed in detail in Section 5.

### 4.2.2 Works Description

The work involves detailed route planning and design to identify the most efficient and least disruptive path for the new OHL routes, taking into account environmental and community impact, as well as power losses and other technical parameters.

The bays in the substations used for the WCN-2 scheme are expected to be connected directly into the OHL network via a gantry to avoid the costly use of either cables or GIL.

Regarding the overhead lines, a study during the detailed engineering is required to determine the necessary number of conductors and their sizing. It is expected that the OHLs should be able to carry about 3100MVA at 400kV, although this would have to be confirmed at a later stage.

The construction activities will involve erecting new pylons, stringing conductors, implementing grounding and lightning protection systems, and ensuring proper insulation and clearance from other utilities and structures, along with the necessary civil works.

All equipment to be designed, built, and commissioned to NGET standards, specifications and procedures.

### 4.2.3 Risks, Constraints and Opportunities

The installation of overhead lines for WCN-2 carries several significant risks and constraints that must be carefully managed throughout the project. One of the primary risks involves land procurement issues, which can lead to delays and increased costs if negotiations with landowners are protracted or if compulsory purchase orders become necessary. Securing the necessary permits and approvals from local authorities and regulatory bodies is another critical risk, as any delays or rejections in the permitting process can significantly impact the project timeline and budget.

Environmental impact assessments (EIAs), which are further explained in Section 5, pose another considerable risk. Negative findings from these assessments may necessitate route alterations, additional mitigation measures, or even project redesigns, all of which can extend the project duration and escalate costs.

In the UK, there is currently a reduced number of specialised workers to undertake the necessary works on OHLs, which could lead to delays. Another critical risk is procurement delays; the required materials and components for OHLs often have long lead times, which can delay the project if not properly accounted for. To mitigate this, the procurement order should be done in advance of the construction phase.

Accessing and working at construction sites, especially in environmentally sensitive areas, presents additional logistical challenges. Restricted access can limit the available working hours and require specialized equipment or techniques, further complicating the construction process.

Once a preliminary route has been established using the environmental criteria, desktop ground investigation studies should be undertaken to ensure there are no geological or geographical constraints that could lead to challenges further down the project lifecycle.

Lastly, there are several 132kV and 33kV existing OHL which may require crossing, possibly leading to some substation works at DNO substations and DNO circuit diversions.

### 4.2.4 Programme and Outages

The programme for the OHL construction will be phased to align with the construction of the substations, both the ones which form part of this scheme, and the ones being carried out by the TO, which are expected to be completed by the time the OHL networks are ready to be commissioned.

It is important that the TO coordinates with the contractors to time the construction phases effectively to reduce the need for outages to integrate the OHL system, ensuring continuity of supply as much as possible.

The OHL works are expected to be the limiting factor in regard to meeting the projected delivery date, mainly due to the extensive civil works required and the long wait time for materials and equipment, for which procurement should be undertaken at the earliest opportunity. To manage construction resource limitations, it can be expected this work would be divided into several packages.

In total, it is estimated that the OHL works would last around 4.5 years from design to commissioning.

### 4.2.5 Summary

The connections between the different substations conforming the WCN-2 scheme shall be via overhead lines due to the long distances between them. Routeing must avoid rural settlements such as Dumfries and New Cumnock, with necessary permits and land access assumed to be granted without delays. Route planning will focus on minimising disruption, and the connections to the substations are expected to be via gantries. Risks include land procurement, permitting delays, environmental assessments and community opposition. The project timeline shall align the works and outages being carried out by SPT, aiming to minimising impact and programme, and ensuring continuity of supply within the area.

## 4.3 Cabling

A cable section is not envisioned to be necessary for this scheme. However, this should be confirmed at a later stage as it could be required in specific locations if OHL is not deemed achievable.

## 4.4 Construction Risks Summary

The main construction risks within this scheme are related to the OHL works, specifically the installation of the pylons. These involve the procurement of multiple parcels of land with the inherent risk of issues with landowners and necessary approvals. The route is also constrained by all the environmental factors that need to be considered which can lead to consenting limitations, although these are mitigated as much as possible in the following section.

Other factors to account for are the long procurement times for the necessary equipment, the possibility of limited resources, both material and labour, or the logistical issues during construction, as well as findings during the surveys which could hinder the installation of the towers and delay the overall programme of the project.

# 5. Environment and Consenting Considerations

## 5.1 Overview

A preliminary routeing study has been undertaken to identify the key constraints present which would influence the development of a continuous OHL route between Kilmarnock South to a new substation in the Carlisle area which traverses the border between England and Scotland, and in particular, the potential impact on the programme, which could consequently affect the reinforcement's Earliest in Service Date (EISD).

As part of this study, a preliminary route has been identified having regard to industry standard routeing practices, such as the Holford Rules. However, it should be noted that this is not a preferred or recommended route, but rather an indicative route for the purposes of evaluating the WCN-2 scheme as a potential project to be subject to Early Competition. A more detailed routeing study would need to be undertaken to demonstrate appropriate consideration of alternatives in line with the requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

## 5.2 Study Area and Key Constraints

The study area is illustrated in,**Error! Reference source not found.** and in more detail in Appendix B. The following s ub-sections highlight some of the key environmental and community related constraints that would influence the development, assessment and consenting of WCN-2.

**Figure 5: Study Area**

## 5.2.1 Ecology and Nature Conservation

There are a number of statutory ecological designations present throughout the study area including Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs) as well as sites identified as ancient woodland or ancient and semi natural woodland. These ecological designations refer to the classification or categorization of areas based on their ecological significance and value and are used to identify and protect important habitats, species, and ecosystems. Ecological designations can pose specific constraints to an OHL route.

SPAs are concentrated to the north of the route at New Cumnock and further east at Carlisle, both to the north and south of the OHL. Solway Firth SPA/SAC/Ramsar is the largest designated site within the study area. SACs are primarily located in the eastern section of the OHL route at Carlisle. SSSIs are abundant along the route from west to east, with a few located in close proximity to the OHL. Ancient woodlands are scattered throughout the study area, with a large concentration at Thornhill and further east at Tundergarth.

Travelling from the west of the study area near New Cumnock, there is one SPA, Muirkirk and North Lowther Uplands (designated for breeding Golden plover and Hen Harrier) which is situated near Sanquhar and approximately 100m north of the OHL route. Upper Nithsdale Woods (for Annex I habitats) and Airds Moss (for Annex I habitats), and Tynron Juniper Wood (for Annex I habitats) have been designated as SACs. Airds Moss SCA is approximately 7km north of the OHL, Tynron Juniper Wood Sac is approximately 1.5km south of the OHL, while at its closest point, Upper Nithsdale Woods SAC is 900m west from the OHL.

Shiel Dod SSSI is located northwest of Dumfries (13km at its closets point to the OHL). Locharbriggs Quarry SSSI is 120m south of the OHL and Lochmaben Lochs SSSI 260m south of the OHL.

The Castle and Hightae Lochs Local Nature Reserve (LNR) is located to the east of Dumfries (approximately 1.7km south of the OHL), while the Caerlaverock National Nature Reserve (NNR) is situated to the south of Dumfries (14km).

Further east and located by Carlisle is the Solway Firth SPA/SAC/Ramsar (designated for populations of European importance of the following Annex 1 species including Whooper swan and for migratory populations of European

importance) which is approximately 580m south of the OHL route. The route of the OHL has been carefully planned to avoid these designated sites such as: Langholm - Newcastleton Hills SPA (for breeding hen harriers) to the north of Carlisle, North Pennine Moors SPA (for Annex 1 habitats) to the east of Carlisle and Castle Loch, Lochmaben SPA approximately 1.5km south of Watchhill. Further, the Upper Solway Flats and Marshes Sites of Special Scientific Interest (SSSI) and Ramsar and Langholm - Newcastleton Hills SSSI are located to the 580m west and 10km north of Carlisle. The OHL borders Bell's Flow SSSI north of Cadgill.

Ancient woodland is abundant throughout the study area and has been avoided whenever possible to prevent habitat disturbance and loss.

### 5.2.2 Landscape

The Solway Coast Areas of Outstanding Natural Beauty (AONB) is situated to the west of Carlisle approximately 790m south of the OHL route and a National Scenic Area is located to the south of Dumfries. The eastern section of the OHL route in Carlisle lies within the Solway Basin National Character Area (England). It will be necessary to consider the surrounding landscape and utilise existing woodland or landforms to screen or provide a backdrop for views of the OHL route.

### 5.2.3 Historic Environment

There are a number of statutory designations present within the study area comprising scheduled monuments and listed buildings. A World Heritage Site, Frontiers of the Roman Empire (Hadrian's Wall), is located approximately 700m west of the OHL route at Carlisle. There is also a Scheduled Monument in the area, Scots Dike, which is approximately 1km east of the OHL route at Carlisle. Longtown Conservation Area is also located to the west of the OHL route. The OHL route bypasses these historic environmental assets.

While such constraints typically occupy relatively small areas and are therefore avoidable subject to careful route selection, there is the potential to impact on their settings.

### 5.2.4 People and Settlement

The study area is densely populated with several large settlements, such as Longtown, Gretna, Lockerbie, Lochmaben, Dumfries, Thornhill, Sanquhar, and New Cumnock. Additionally, there are scattered rural settlements within the wider study area that must be taken into account when developing an OHL route. The OHL route typically avoids these settlements, with minimal disruption likely to occur.

### 5.2.5 Recreational Considerations

There are no country parks present within the study area. Although not within the study area, Westlands Country Park is located near Gretna. Galloway Forest Park is also situated near Kilmarnock. Greenmeadows County Park is located near Carlisle. It is preferable to avoid routeing within Country Parks in order to prevent impacts on the amenity of visitors/users. Careful consideration would need to be given to any new OHL route through the Park in order to reduce impacts as far as possible.

## 5.3 Development of a Route Option

A preliminary route option is illustrated in Figure 5. The WCN-2 scheme comprises a proposed route that extends from Kilmarnock South to a new substation in the Carlisle area. The route has been divided into several sections, as connections to both new and existing substations are required.

The proposed route begins by heading north of New Cumnock before turning south at Kirkconnel. Along the way, the route crosses a railway line at two intervals.

Continuing south, the proposed route passes through Drumfries before heading north above Lochmaben and Lockerbie. Finally, the route heads south towards Gretna, passing through [redacted] before reaching Carlisle.

The route from New Cumnock to Sanquhar offers a direct option that bypasses the Muirkirk and North Lowther Uplands SPA and SSI. Additionally, this route avoids the Solway Firth SPA/SAC/Ramsar, which is the largest designated site within the study area.

Despite these advantages, there are still scattered ancient woodland sites present within a 1km buffer of the preliminary route option. Furthermore, the route traverses several quarries and is located in close proximity to a [redacted]. Figure 5 below shows the possible route.

**Figure 5: Preliminary Route Option**

## 5.4 Development and Consenting of WCN-2 – Legislative Context

As WCN-2 is cross boundary and travels between the jurisdictions of Scotland and England, consent for the OHL route will need to be assessed separately. The legislative context for each jurisdiction is outlined below.

### 5.4.1 Scotland

WCN-2 would be subject to Section 37 of the Electricity Act 1989 and require approval from the Energy Consents Unit under the Planning Act 2019. The Energy Consents Unit would be responsible for making a decision on an application for WCN-2.

Although decision-making takes place at a national level, Local Planning Authorities (LPAs) play a crucial role in the consenting process. It is important to note that, depending on the route design, WCN-2 has the potential to cross and/or impact up to 2 LPAs' administrative areas including Dumfries and Galloway in Scotland and Cumberland in England. While this may not necessarily increase consenting risks, it does expand the number of stakeholders that a Competitively Appointed Transmission Owner (CATO) would need to engage with during the development of WCN-2.

WCN-2 would fall under the category of 'Schedule 1 Development' according to The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000, as it would operate at a voltage of 220kV or higher and have a length exceeding 15km. This classification mandates an Environmental Impact Assessment (EIA) as a statutory requirement. The formal outcome of the EIA process would be an Environmental Statement (ES) that would accompany the application.

### 5.4.2 England

WCN-2 would be classed as Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 and would therefore be subject to a Development Consent Order (DCO) application. The Secretary of State would make a decision on a DCO application for WCN-2 having regard to NPS EN-1 Overarching National Policy Statement (EN-1) and NPS EN-5 Electricity Networks Infrastructure.

While decision-making on DCOs occurs at a national-level, LPAs are key part of the consenting process. Therefore, it is important to note that subject to route design, WCN-2 has the potential to cross and/or affect two Local Planning Authority (LPAs) administrative areas including Dumfries and Galloway in Scotland and Cumberland in England). While this doesn't necessarily increase consenting risks, it does increase the number of stakeholders with whom a CATO would need to engage with in the development of WCN-2.

WCN-2 would be classed as 'Schedule 1 Development' under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as it would operate a voltage of 220kV or more and have a length of 132km which is more than 15km, meaning that Environmental Impact Assessment (EIA) is a statutory requirement. The formal output of the EIA process is an ES which would accompany the DCO application.

# 6. Overall Programme & Schedule Risks

As previously mentioned, WCN-2 is a cross-boundary route that spans across the jurisdictions of Scotland and England. The Scottish section of the route runs from New Cumnock to Gretna (approximately 122km in length), before crossing the border into England and continuing from Longtown to Carlisle (approximately 10km long).

An estimated programme for the whole scheme has been developed and can be found in Appendix A. The projected delivery date for the connection is 2036. Although activities that could prolong the project, such as the long waiting times for materials and equipment, have been considered, there are other possible risks. These are discussed in Table 1 below for each jurisdiction, along with a brief general overview of the programme.

The development of electricity transmission reinforcements of the scale of WCN-2 typically comprise a number of (broadly) sequential stages linked to the EIA and consenting process (in some instances, stages may overlap).

## Table 1: EIA Stages and Consenting Process

| Stages | Scotland | England |
|---|---|---|
| **Optioneering/routeing study** | An optioneering study would consider the most efficient means of developing a reinforcement between New Cunmock and the England border balancing impacts on the environment and communities with technical and economic considerations. The precise duration of the optioneering stage is dependent on a number of factors including the scale and complexity of the reinforcement. In the case of WCN-2, a timescale of 8-10 months is considered realistic. | An optioneering study would consider the most efficient means of developing a reinforcement between the Scottish border and Carlisle balancing impacts on the environment and communities with technical and economic considerations. The precise duration of the optioneering stage is dependent on a number of factors including the scale and complexity of the reinforcement. In the case of WCN-2, a timescale of 8-10 months is considered realistic. |
| **Non-statutory consultation** | The conclusion of the optioneering stage would typically be the identification of a preferred route option which is then subject to non-statutory consultation. This is not a mandatory requirement, but it is consistent with industry standard good practice. The precise duration would depend on overlaps with the optioneering stage as well as scope and duration of consultation and volume of feedback received. For WCN-2, a timescale of 6-8 months (including preparation for consultation and analysis of feedback) is realistic. | The conclusion of the optioneering stage would typically be the identification of a preferred route option which is then subject to non-statutory consultation. This is not a mandatory requirement, but it is consistent with industry standard good practice. The precise duration would depend on overlaps with the optioneering stage as well as scope and duration of consultation and volume of feedback received. For WCN-2, a timescale of 6-8 months (including preparation for consultation and analysis of feedback) is realistic. |
| **Environmental Impact Assessment** | WCN-2 would require to be subject to a statutory EIA in accordance with The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000. EIA has a number of stages and activities (scoping, baseline studies, design integration, impact assessment and reporting). Baseline surveys are usually a key programme driver as some will be subject to seasonal restrictions and/or require access to private land, which in combination can significantly affect the programme. These surveys can include, amongst others:<br>• Ecological surveys: assessing flora and fauna, including protected species, habitat and biodiversity levels. This might involve seasonal studies.<br>• Water quality and hydrology surveys: measuring the quality of surface and groundwater, monitoring water flow patterns, and understanding the hydrological characteristics of the area. | WCN-2 would require to be subject to a statutory EIA in accordance with the Infrastructure Planning (EIA) Regulations 2017. EIA has a number of stages and activities (scoping, baseline studies, design integration, impact assessment and reporting). Baseline surveys are usually a key programme driver as some will be subject to seasonal restrictions and/or require access to private land, which in combination can significantly affect the programme. These surveys can include, amongst others:<br>• Ecological surveys: assessing flora and fauna, including protected species, habitat and biodiversity levels. This might involve seasonal studies.<br>• Water quality and hydrology surveys: measuring the quality of surface and groundwater, monitoring water flow patterns, and understanding the hydrological characteristics of the area. |

| | | |
|---|---|---|
| | • Soil and geology surveys: analysing soil composition, stability, and contamination levels, as well as geological features and processes.<br>• Cultural Heritage Surveys: identifying and documenting archaeological and historical sites to ensure they are preserved or appropriately managed during project development.<br>Findings during these surveys can delay the project and negatively impact the programme. While certain activities can be overlapped to optimise the programme, it is not uncommon for EIA programmes to be in order of 24-36 months. In the case of WCN-2, a timescale of 30 months is considered realistic. | • Soil and geology surveys: analysing soil composition, stability, and contamination levels, as well as geological features and processes.<br>• Cultural Heritage Surveys: identifying and documenting archaeological and historical sites to ensure they are preserved or appropriately managed during project development.<br>Findings during these surveys can delay the project and negatively impact the programme. While certain activities can be overlapped to optimise the programme, it is not uncommon for EIA programmes to be in order of 24-36 months. In the case of WCN-2, a timescale of 30 months is considered realistic. |
| **Statutory Consultation** | Under the Planning Act 2019 there is a requirement for statutory consultation to be undertaken including preparation of a Preliminary Environmental Information Report (PEIR). Statutory consultation would be undertaken with local communities, persons with an interest in the land affected by the project, LPAs and statutory consultations. This would be undertaken during the EIA stage outlined above and would therefore not be expected to add to the timescales. | Under the Planning Act 2008 there is a requirement for statutory consultation to be undertaken including preparation of a Preliminary Environmental Information Report (PEIR). Statutory consultation would be undertaken with local communities, persons with an interest in the land affected by the project, LPAs and statutory consultations. This would be undertaken during the EIA stage outlined above and would therefore not be expected to add to the timescales. |
| **Application and Examination** | On submission of an application there are a number of stages; acceptance (a 28 day period), pre-examination (typically a three month period), examination (typically up to six months), recommendation and decision (recommendation within three months of the close of examination and decision by Scottish Ministers within three months of receipt of the recommendation to grant or refuse consent). It is not uncommon for decisions on applications to be delayed. In the case of WCN-2 a timescale of 18 months is considered realistic. | On submission of a DCO application there are a number of stages; acceptance (a 28 day period), pre-examination (typically a three month period), examination (typically up to six months), recommendation and decision (recommendation within three months of the close of examination and decision by the Secretary of State within three months of receipt of the recommendation to grant or refuse consent). It is not uncommon for decisions on DCO applications to be delayed. In the case of WCN-2 a timescale of 18 months is considered realistic. |
| **Overall Programme** | The stages for each jurisdiction will be run simultaneously. The overall timescale for the environment process and examination is calculated to be 66 months (note this is approximate and there are likely to be opportunities to optimise this). | |

Once the examination is completed, project delivery can proceed. Works on the substations, OHL and cables (if applicable) can all be simultaneous and will start with the detailed design and procurement stage. In order to avoid any delays, it is imperative to begin the procurement of long lead items as soon as possible, with special emphasis on cables and some substation plant items. Additionally, delays can also be mitigated by early contracts with EPC being in place early.

There is also a possibility of de-risking the project delivery date via innovative procurement methods, including CATO paying the EPC tenderers to do the FEED design to expedite the delivery programme.

During the construction and installation, which is expected to last just under 4 years in the case of the OHL works, other risks can delay the programme, such as active opposition from protesters, limited availability of key resources (which could be outside the control of the CATO, for example, Scottish Power and National Grid Electricity Transmission SAPs and commissioning engineers), site access delays (which can be mitigated by negotiating and agreeing site access arrangements upfront as part of the pre-DCO examination work) or adverse weather.

As a result, the expected delivery date of the project is **November 2036**. To account for the possible setbacks during the course of the project, the programme includes a 12-month period named “Impact of risks – potential schedule slippage”, which would push back the date to late 2037.

# 7. Summary

This report has laid out a preliminary evaluation of the WCN-2 scheme, which involves the 400kV double circuit connection between New Cumnock and Carlisle 400kV substations via Glenmuckloch, Dumfries North and Wyseby Hill substations, all of which are located in the southwest of Scotland or Northwest of England.

The main assumptions, limitations and risks that could affect the project have been indicated, along with a high-level overview of the scope the project would entail, along with an estimated programme. In addition to the necessary works on substations, OHLs and cables, the key environmental and consent constraints have been listed.

All the above has resulted in a preliminary route between the substations, which avoids all major constraints and is deemed like a feasible option (although a more detailed study will be required at a later stage). This route, which would be approximately 132km in length, avoids ecological designations and ancient woodland as much as possible.

## 7.1 Programme Summary

The estimated programme for WCN-2, shown in Appendix A, covers the project’s timeline from the early competition process to the energisation of the connection. The early competition is set to take just under 3 years, although by the time a preferred bidder is chosen, works on establishing the preferred option of the route is to have been chosen.

Once the contractor and option have been established, works on the environmental surveys and consultations can go ahead, which are expected to last just under 5 years. Once completed, an examination of around 1.5 years will take place. If any findings arise that may affect the project, these are to be evaluated and actioned upon as soon as possible to avoid significant delays in the programme.

As the examination is completed towards the middle of 2032, detailed design works are to commence for the substations and OHLs (and cabling if necessary). During this, procurement for the necessary equipment is to be undertaken at the earliest opportunity, as waiting times on certain materials and equipment is very long and could affect the delivery of the programme.

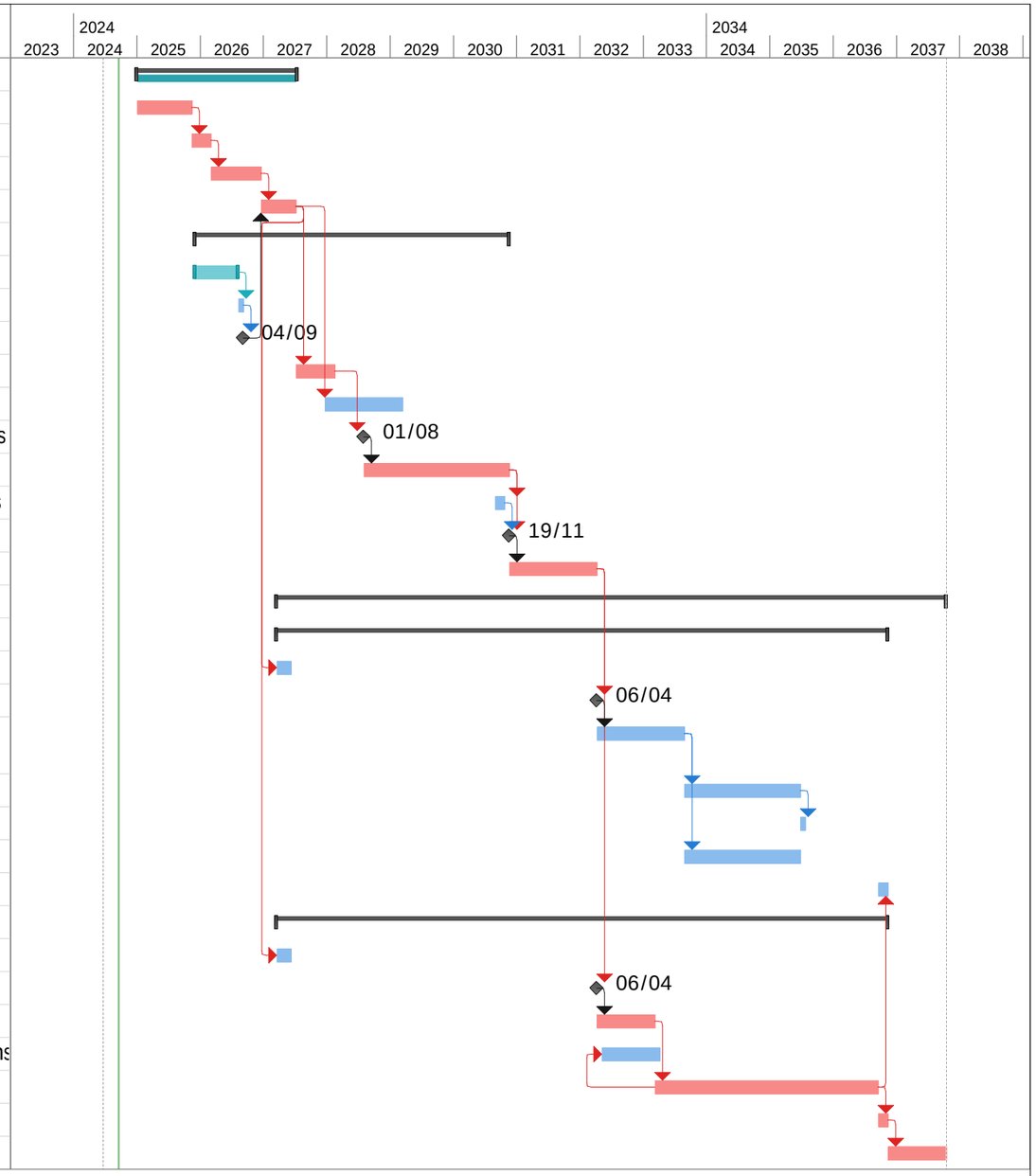
Construction for the substations, cables and OHLs can start simultaneously, with the latter expected to be the longest at around 4 years given the long distance of the scheme’s route.

Therefore, the estimated delivery programme indicates an EISD of November 2036. The realisation of any of the delivery risks which cannot be mitigated at the planning stage would extend the programme to an extent which by

the nature of the risks is not possible to precisely quantity in advance. However, based upon experience it is estimated these risks may add a further 12 to 18 months to the actual completion date. These risks include, but are not limited to, issues with landowners and permits, consenting constraints, limitations actioning the necessary outages for the connection, resource and material unavailability, or findings during the surveys that could significantly affect the programme.

# Appendix A Programme Gantt Chart

| ID | Task Mode | Task Name | Duration | Start | Finish | Predecessors |
|---|---|---|---|---|---|---|
| 1 | | Early Competition Process | 33 mons | Wed 01/01/25 | Tue 13/07/27 | |
| 2 | | Pre-Tender Stage | 45 wks | Wed 01/01/25 | Tue 11/11/25 | |
| 3 | | PQ Stage | 16 wks | Wed 12/11/25 | Tue 03/03/26 | 2 |
| 4 | | ITT Stage | 41 wks | Wed 04/03/26 | Tue 15/12/26 | 3 |
| 5 | | Preferred Bidder Stage | 29 wks | Wed 16/12/26 | Tue 06/07/27 | 4,9 |
| 6 | | Pre-Application Stage | 1297 days | Mon 01/12/25 | Tue 19/11/30 | |
| 7 | | Optioneering/Routeing Study | 9 mons | Mon 01/12/25 | Fri 07/08/26 | |
| 8 | | Identification of Preferred Option | 1 mon | Mon 10/08/26 | Fri 04/09/26 | 7 |
| 9 | | Design freeze 1 | 0 mons | Fri 04/09/26 | Fri 04/09/26 | 8 |
| 10 | | Non-Statutory Consulation | 8 mons | Wed 07/07/27 | Tue 15/02/28 | 5 |
| 11 | | Baseline Surveys | 16 mons | Wed 22/12/27 | Tue 13/03/29 | 5FS+6 mons |
| 12 | | Design Freeze 2 | 0 mons | Tue 01/08/28 | Tue 01/08/28 | 10FS+6 mons |
| 13 | | Environmental Impact Assessment | 30 mons | Wed 02/08/28 | Tue 19/11/30 | 12 |
| 14 | | Statutory Consulation | 2 mons | Wed 28/08/30 | Tue 22/10/30 | 13FS-3 mons |
| 15 | | Application | 0 mons | Tue 19/11/30 | Tue 19/11/30 | 13,14 |
| 16 | | Examination | 18 mons | Wed 20/11/30 | Tue 06/04/32 | 15 |
| 17 | | Project Delivery | 2760 days | Wed 17/03/27 | Tue 13/10/37 | |
| 18 | | Substations | 2520 days | Wed 17/03/27 | Tue 11/11/36 | |
| 19 | | Construction Contract Tender (Substations) | 3 mons | Wed 17/03/27 | Tue 08/06/27 | 5FS-16 wks |
| 20 | | Contract Award (Substations) | 0 mons | Tue 06/04/32 | Tue 06/04/32 | 16 |
| 21 | | Contractor Detailed Design and Procurement | 18 mons | Wed 07/04/32 | Tue 23/08/33 | 20 |
| 22 | | New Cumnock 400kV Site Works | 24 mons | Wed 24/08/33 | Tue 26/06/35 | 21 |
| 23 | | Commissioning of New Cumnock 400kV | 1 mon | Wed 27/06/35 | Tue 24/07/35 | 22 |
| 24 | | Dumfries North 400kV Site Works | 24 mons | Wed 24/08/33 | Tue 26/06/35 | 21 |
| 25 | | Commissioning of Dumfries North 400kV | 2 mons | Wed 17/09/36 | Tue 11/11/36 | 31 |
| 26 | | OHL works | 2520 days | Wed 17/03/27 | Tue 11/11/36 | |
| 27 | | Construction Contract Tender | 3 mons | Wed 17/03/27 | Tue 08/06/27 | 5FS-16 wks |
| 28 | | Contract Award | 0 mons | Tue 06/04/32 | Tue 06/04/32 | 16 |
| 29 | | Contractor Detailed Design/ Procurement | 12 mons | Wed 07/04/32 | Tue 08/03/33 | 28 |
| 30 | | OHL route - Environmental mitigations | 12 mons | Wed 05/05/32 | Tue 05/04/33 | 31SS-11 mons |
| 31 | | OHL installation works | 46 mons | Wed 09/03/33 | Tue 16/09/36 | 29 |
| 32 | | Final commissioning and energisation | 2 mons | Wed 17/09/36 | Tue 11/11/36 | 31 |
| 33 | | Impact of risks - Potential Schedule Slippage | 12 mons | Wed 12/11/36 | Tue 13/10/37 | 32 |




Project: Integrated Programme
Date: Wed 18/09/24

| | | | | | |
|---|---|---|---|---|---|
| Task | Inactive Task | Manual Summary Rollup | External Milestone | Manual Progress | |
| Split | Inactive Milestone | Manual Summary | Deadline | | |
| Milestone | Inactive Summary | Start-only | Critical | | |
| Summary | Manual Task | Finish-only | Critical Split | | |
| Project Summary | Duration-only | External Tasks | Progress | | |

# Appendix B Environmental Constraints

# Explanation of the substation scope for the competed elements of WCN2.

## Executive summary

The Dumfries North substation is included in Ofgem's consultation on the competitive element of WCN2 because it meets the selection criteria as defined in the Electricity (Criteria for Relevant Electricity Projects) (Transmission) Regulations 2024.

Factors considered in the NESO assessment for Dumfries North substation are detailed below. Also included is a summary of why other substations that formed part of WCNC and WCN2 have not been included as part of the competitive elements of WCN2.

## Information considered

When considering the elements of the project considered for competition, various information was considered including the System Requirements Forms (SRF) submitted as part of the tCSNP2 process, further information received from SPEN, as well as connection information held by the NESO. SPEN did not provide an SRF for WCN2 but have done so for the earlier iteration of the project, WCNC. The SRF document details the circuits in Scotland as a new 400kV double circuit between Kilmarnock South to Glenmuckloch and then on to the B6 boundary. SPEN wouldn't be expected to provide detail further south of the B6 boundary as this is in NGET's region.

The SRF for WCNC names two new substations on the route, one at Killoch, and one at New Cumnock.

Following review of the SRF during the project identification process, the then ESO requested further information on WCN2 from SPEN to enable the consideration of the WCN2 project for early competition in more detail. This was provided by SPEN and identified that the proposals would require the WCN2 circuits to go via two additional substations: Dumfries North and Wyseby Hill before crossing the B6 border.

## Summary of assessment

When considering the scope of the substation works to be competed, the following factors were considered for each substation, running from North to South:

### Kilmarnock South

This is an existing substation and therefore not considered within the competed scope.

### Killoch

This substation is to be provided along the refurbishment element of the northern section of the WCN2 project and therefore discounted for competition.

### New Cumnock

This substation is proposed to be energised in 2033 and was discounted for competition due to timescales.

### Glenmuckloch

This substation is proposed to be energised in 2033 via an extension to the existing ZV route. As a result, this was not included in the competed works due to its earlier need by other projects.

### Dumfries North

The key points for including Dumfries North within the scope are:

- Given the expected connection demand within the area, a substation will need to be provided along the WCN2 route.
- Dumfries North will be on the route of the WCN2 circuits.
- Dumfries North will be energised to 400kV solely via the WCN2 circuits.
- Dumfries North will need constructing and commissioning alongside the WCN2 circuits at the same time.
- The inclusion of Dumfries North provides consumer benefit by virtue of the added savings to funding, Capex, and Opex found through the CBA.
- Stakeholder (potential bidder) engagement post Ofgem's consultation has been positive on the inclusion of Dumfries North, with one potential bidder questioning why further substation scope had not been included.

Whilst there are several existing connection offers listed with Dumfries North as enabling works, it is important to note that all customer connections will be subject to connection reform. As a result, the exact details of the customer connections and the optimal design needed at Dumfries North cannot be confirmed at this early stage and may be subject

to change. However, what we do know is that there is connection demand along the route of WCN2 and so it is prudent to include this within the competed scope rather than dealing with this post award.

The NESO have referred to the proposed substation as “Dumfries North” in line with SPEN’s information however the location of this substation will need to be determined by the winning bidder considering SPEN’s requirements in connecting SPEN’s proposed development of the wider network into the new substation. General principals can be included in the tender requirements.

### Wyseby Hill

Wyseby Hill is due to be energised in 2031 via an extension to the existing ZV route. As a result, this was not included in the competed works due to its earlier need by other projects.

The connection to Wyseby Hill may just be a turn in and out and may not physically connect the WCN2 circuits to the rest of the 400kV network at this substation, so the requirement for connection of the WCN2 circuits here is something that needs to be clarified with SPEN during pre-tender.

### Carlisle

Carlisle is due to be energised in either 2033 or 2035 via an extension to other planned new or replacement circuits within England. As a result, this was not included in the competed works due to its earlier need by other projects.