

Consultation

Yorkshire GREEN – Consultation on the project’s Final Needs Case

Publication date: 10th March 2023

Response deadline: 07th April 2023

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We are consulting on our views on the Yorkshire GREEN energy enablement project. We would like views from people with an interest in new transmission infrastructure, meeting the net zero challenge, and competition in onshore transmission networks. We particularly welcome responses from consumer groups, stakeholders impacted by the project, stakeholders with an interest in the costs of electricity transmission infrastructure, and transmission owners. We would also welcome responses from other stakeholders and the public.

This document outlines the scope, purpose and questions of the consultation and how you can get involved. Once the consultation is closed, we will consider all responses. We want to be transparent in our consultations. We will publish the non-confidential responses we receive alongside a decision on next steps on our website at [ofgem.gov.uk/consultations](https://www.ofgem.gov.uk/consultations). If you want your response – in whole or in part – to be considered confidential, please tell us in your response and explain why. Please clearly mark the parts of your response that you consider to be confidential, and if possible, put the confidential material in separate appendices to your response.

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Executive summary

Yorkshire GREEN and what this document covers

In August 2022 we received a Final Needs Case (FNC) submission from National Grid Electricity Transmission plc (NGET), who own and operate the transmission network in England and Wales, regarding the proposed ‘Yorkshire Green Energy Enablement’ (Yorkshire GREEN) project.

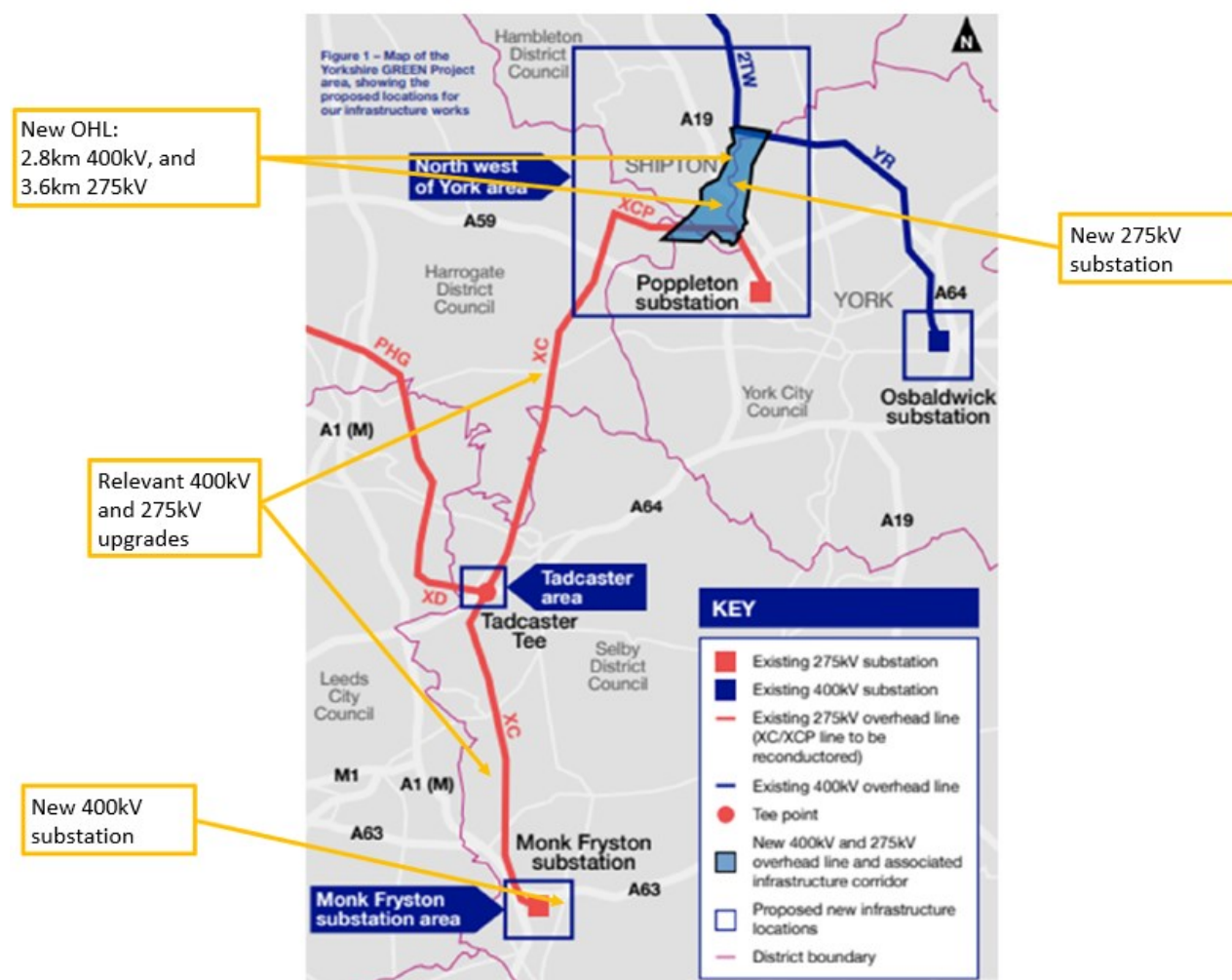
Yorkshire GREEN is an electricity transmission project to construct:

- New 400kV substation extension at Monk Fryston, inclusive of protection and control of transformers to connect back into the existing 275kV substation;
- New 275kV substation to be installed at Overton, inclusive of transformers, protection, and control sited off the existing XCP overhead lines (OHL) route. XCP OHL shall be renamed to XC (west of Overton) and SP (East of Overton);
- c.6.4km of new OHL, 2.8km at 400kV and 3.6km at 275kV, connecting the existing OHL with Overton substation, and Overton substation to the existing 275kV OHL; and
- Relevant 400kV and 275kV upgrades.

The project is triggered by the need to increase the capability of major boundaries¹ (B7a and B8) within NGET’s network in the North of England. This need is required to manage increasing power flows from the North to the South of England. NGET estimates that the project will cost £298m, down from £392m as per the Initial Need Case (INC), due to the project’s scope refinement since then. The project will provide a boundary uplift of c.1.7GW and 394MW on boundaries B7a and B8 respectively.

¹ Transmission boundaries split the electricity transmission system. A single boundary splits into two parts which represent pinch points on the network. This split crosses critical circuit paths that carry power between the areas where power flow limitations may be encountered. For more information on boundaries, see the [ESO's Electricity Ten Year Statement 2020](#)

Figure 1: Scope of preferred option, OPN2, for Yorkshire GREEN



In accordance with our RIIO-2 price control arrangements, we have been assessing the need for the proposed project under our Large Onshore Transmission Investment (LOTI) re-opener mechanism² and its suitability for applying a competition model.

This consultation seeks stakeholder views on our assessment of the FNC for the Yorkshire GREEN project. The FNC stage is intended to provide clarity for NGET and wider stakeholders on our view on the progress of the project to-date. It also sets out our thoughts on the suitability of applying a late competition model to the project.

² [Special condition 3.13 of the Electricity Transmission licence](#) and the [LOTI Guidance](#)

Final Needs Case assessment

NGET has made a clear needs case for the Yorkshire GREEN project. In our view, NGET has made the case for the required capability uplift to the relevant boundaries within the context of plausible future generation and demand scenarios. The project is also critical to realising the full benefits of the first Eastern HVDC Link³ (E2DC) which is a separate project.

We are satisfied that NGET considered a range of appropriate options and that their preferred option, OPN2, is the optimal solution. Refinement of NGET’s preferred option in terms of technical design resulted in NGET identifying cost savings of c.£94m since their INC submission, reducing the project’s overall capital expenditure from £392m down to £298m.

We consider that the cost benefit analysis (CBA) undertaken by NGET as part of their FNC submission is robust and supports the need for the project. We are satisfied that the CBA results show that NGET’s preferred option, OPN2, is the optimal option in comparison to the other options considered. We note that this is partly due to the earliest delivery date being sooner than various alternative options which highlights that the benefits of an earlier delivery date outweigh the lower cost alternatives with later dates. We therefore expect NGET to continue progressing the Yorkshire GREEN project in a timely manner to ensure that the benefits are fully realised.

In December 2022 we published our decision on Accelerating Strategic Transmission Investment (ASTI)⁴. This decision sets out how we will support the accelerated delivery of strategically important electricity transmission upgrades that are needed to meet the Government’s 2030 renewable electricity generation ambitions. This included steps we will take to streamline the regulatory approval process for qualifying projects by providing early funding certainty and reducing the number of regulatory approval stage gates. It also includes the exemption of the projects from consideration for delivery via a competition model. The Yorkshire Green project is one of the projects that we have included in the ASTI framework⁵. We are planning to implement the changes explained in our ASTI decision into Transmission Owner (TO) licences later this year. Until that time, we will continue our assessment of this project under the LOTI mechanism.

³ [Eastern HVDC - Conditional Decision on the projects’ Final Needs Case](#)

⁴ [Decision on accelerating onshore electricity transmission investment](#)

⁵ [Decision on accelerating onshore electricity transmission investment](#). Please note that the Yorkshire GREEN project is listed as project OPN2

Under the LOTI mechanism NGET is required⁶ to secure all material planning consents before submitting a FNC unless we direct otherwise. In July 2022, we waived this requirement for NGET and issued a direction⁷ because of the strategic importance of the Yorkshire Green project, and to provide clarity on our view of the project to help ensure timely project completion given the potential detriment likely to be suffered by consumers if the project is delayed.

We note from the timeline presented by NGET in its FNC submission that the decision on all material planning consents is not due until February 2024, which is after our planned FNC decision publication date. **Our decision as to whether we approve the FNC for NGET’s proposed design of the Yorkshire Green project under the LOTI mechanism will be conditional on NGET subsequently securing all material planning consents thereby demonstrating NGET’s readiness⁸ to proceed with the Project Assessment (PA) stage of the LOTI mechanism.**

When the changes explained in our ASTI decision are implemented into NGET’s licence, the Yorkshire Green project will then be considered under the ASTI arrangements instead of continuing under the LOTI mechanism.

Delivery via a competition model

Yorkshire Green is currently being considered under the LOTI mechanism in line with our Final Determinations for the RIIO-2 price control for electricity transmission. Under this regime, the majority of the Yorkshire Green project meets the criteria for late model competition and these elements could be separated into a ‘repackaged’ project that could be considered for late model competition.

However, in our December 2022 ASTI decision we decided that all projects intended to fall under the new ASTI regime, which includes the Yorkshire Green project, will be exempt⁹ from consideration for delivery via a model of competition. Therefore, provided the ASTI regime is implemented as planned, Yorkshire Green will not be considered for delivery via a competition model.

⁶ [Decision on the proposed modifications to the RIIO-2 Transmission, Gas Distribution and Electricity System Operator licence conditions - 1 April 2022](#), special condition 3.13.14 of NGET’s electricity transmission licence

⁷ [Direction - Yorkshire GREEN Final Needs Case submission](#)

⁸ [Large Onshore Transmission Investments \(LOTI\) Re-opener Guidance](#), paragraph 6.5

⁹ [Decision on accelerating onshore electricity transmission investment](#), table 4. Please note that the Yorkshire GREEN project is listed as project OPN2

Large project delivery

Under the LOTI mechanism, we typically assess the approach to late delivery of large projects¹⁰. However, as explained above, it is intended that the Yorkshire Green assessment will transition from the LOTI mechanism onto the ASTI regime once the ATSI regime is in place.

Our view is that there is a need to protect the interests of existing and future consumers from the impact of project delivery delay for Yorkshire Green because such a delay may lead to significant additional constraint costs. As such, if the project remained under LOTI, we would consider the application of a Project Delivery Charge (PDC) at the PA stage. However, under the ASTI regime, we will instead consider the application of an output delivery incentive (ODI)¹¹ that rewards/penalises NGET for delivery against target delivery dates.

Next steps

We welcome responses to our consultation on the specific questions we have included in Chapter 2. If you would like to respond to this document then please send your responses to: RIIOElectricityTransmission@ofgem.gov.uk. The deadline for responses is 07 April 2023. We plan to publish our conditional decision on the FNC for Yorkshire GREEN in Spring 2023.

¹⁰ [RIIO-2 Final Determinations](#), ET Annex (REVISED), page 32 onwards

¹¹ [Decision on accelerating onshore electricity transmission investment](#), chapter 7, table 10. Please note that the Yorkshire GREEN project is listed as project OPN2

1. Introduction

What are we consulting on?

- 1.1 As set out in the LOTI guidance, the purpose of the FNC stage is to review the progress and changes to the project since the INC stage and reach a final view on whether the project proposed by NGET is needed. The Yorkshire GREEN project will increase power flows through reinforcement of the B7a and B8 system boundaries in the North of England between the Scottish border and the North Midlands.

Chapter 2: Yorkshire GREEN Final Needs Case assessment

- 1.2 Chapter 2 summarises our findings on the FNC for this project, the conclusions of our assessment, and our proposed position. Our questions are:
- Q1: Do you agree with the technical need for investment on the transmission network?
 - Q2: Do you agree with our conclusions on the technical options considered?
 - Q3: Do you agree with our conclusions on the CBA and the appropriateness of the option taken forward?

Chapter 3: Delivery via a competition model

- 1.3 Chapter 3 summarises our proposed position on whether the project meets the criteria for late competition and whether it should be funded through a late competition model.

Chapter 4: Large project delivery

- 1.4 Chapter 4 summarises the Large Project Delivery (LPD) funding mechanism and our proposed view of its applicability to the project.

Chapter 5: Next steps

- 1.5 Chapter 5 summarises our expectation for the next stages of assessment.

Context

- 1.6 Great Britain’s (GB) onshore electricity transmission network is currently planned, constructed, owned, and operated by three Transmission Owners (TOs): National Grid Electricity Transmission (NGET) in England and Wales, Scottish Power Transmission (SPT) in the south of Scotland, and Scottish Hydro Electric Transmission (SHET) in the north of Scotland. We regulate these TOs through the RIIO (Revenue = Incentives + Innovation + Outputs) price control framework. For offshore transmission, we appoint Offshore Transmission Owners (OFTOs) using competitive tenders.
- 1.7 The incumbent onshore TOs are currently regulated under the RIIO-2 price control which started on 01 April 2021 and will run for 5 years. Under this price control we developed a mechanism for assessing the need for, and efficient cost of, large and uncertain electricity transmission reinforcement projects. This mechanism is called ‘Large Onshore Transmission Investment’ (LOTI). Once the need for and the costs of projects have become more certain, the TOs will submit construction proposals and seek funding for them. As explained in chapter 9 of the RIIO-2 Final proposals – Core Document¹² (REVISED), all projects that come forward for assessment via the LOTI re-opener mechanism during the RIIO-2 period will be considered for their suitability for delivery through one of the late competition models.
- 1.8 Network investment is informed by the Future Energy Scenarios (FES)¹³ and the Network Options Assessment (NOA)¹⁴ which are developed and published annually by the Electricity System Operator (ESO). A key focus of the FES 2020 is the inclusion of the legally binding¹⁵ UK Government Net Zero targets which are to be achieved by 2050. The transition to a Net Zero economy will see increased demand on transmission boundary capability which will need to be facilitated by critical network reinforcements.
- 1.9 Our assessment and proposed position set out in this document is subject to consultation and we invite stakeholders to respond using the contact details set

¹² [RIIO-2 Final Determinations](#), Core Document (REVISED), chapter 9

¹³ [ESO Future Energy Scenarios \(FES\)](#)

¹⁴ [ESO Network Option Assessment \(NOA\)](#)

¹⁵ [The Climate Change Act 2008 \(2050 Target Amendment\) Order 2019](#)

out on the front of this document. We have indicated questions for stakeholders at the start of each chapter where relevant.

Overview of LOTI re-opener mechanism

- 1.10 The LOTI re-opener mechanism provides TOs with a route to apply for funding for large investment projects that can be shown to deliver benefits to consumers, but that were uncertain or not sufficiently developed at the time we set costs and outputs for the RII0-2 price control period. The LOTI mechanism provides a robust assessment process through which we can ensure that TO proposals represent value for money for existing and future consumers.
- 1.11 To qualify for the LOTI mechanism, TO proposals must meet the following criteria:
- a) be expected to cost £100m or more of capital expenditure; and
 - b) be, in whole or in part, load related¹⁶.
- 1.12 We are satisfied that the Yorkshire GREEN project meets the criteria and is eligible¹⁷ as a LOTI project. We are therefore assessing the Yorkshire GREEN project in accordance with the LOTI mechanism as detailed in the LOTI Guidance¹⁸.

Stages of our LOTI assessment

- 1.13 Following the approval of eligibility, our LOTI mechanism is made up of three main stages:
1. **Initial Needs Case (INC)** – The usual focus of our assessment at this stage is to review the technical and/or economic need for the project, the technical options under consideration, and the TOs justification for taking forward its preferred option for further development.
 2. **Final Needs Case (FNC)** – Following the securing of all material planning consents for the project, the TO will then need to submit a FNC (unless we specify

¹⁶ Part (b) of this criterion used to be either “wholly or partly load related” or “shared-use or sole-use generator connection project related”. As a result of a licence modification, which came into effect on 24 July 2021, the “shared-use or sole-use generator connection project” criterion no longer applies. However, this does not impact the project as this is in part a load related project. For further information on the licence modification, see the [Decision on the proposed modifications to the RII0-2 Transmission, Gas Distribution and Electricity System Operator licence conditions](#)

¹⁷ [RIIO-2 Final Determinations](#), NGET Annex (REVISED), section 3.60

¹⁸ [Large Onshore Transmission Investments \(LOTI\) Re-opener Guidance](#)

alternative timing). The focus of our assessment at this stage is to confirm the need for the project by checking that there have been no material changes in technical and/or economic drivers that were established in the INC.

3. Project Assessment (PA) – If the FNC is approved, the TO will then need to apply for a PA direction. The focus of our assessment at this stage is the assessment of the proposed costs and delivery plan that the TO has in place for the project, with a view to potentially specifying in the TOs licence a new LOTI Output, a LOTI Delivery date, and setting the efficient cost allowances that can be recovered from consumers for delivery of the project.

Related publications

- 1.14 RIIO-2 Final Determinations – Core Document and NGET Annex – both REVISED: [Ofgem.gov.uk/publications-and-updates/riio-2-final-determinations-transmission-and-gas-distribution-network-companies-and-electricity-system-operator](https://www.ofgem.gov.uk/publications-and-updates/riio-2-final-determinations-transmission-and-gas-distribution-network-companies-and-electricity-system-operator)
- 1.15 LOTI Re-opener Guidance document: [Ofgem.gov.uk/publications-and-updates/large-onshore-transmission-investments-loti-re-opener-guidance](https://www.ofgem.gov.uk/publications-and-updates/large-onshore-transmission-investments-loti-re-opener-guidance)
- 1.16 Consultation of Accelerating Strategically Important onshore electricity Transmission Investment (ASTI): [Ofgem.gov.uk/publications/consultation-accelerating-onshore-electricity-transmission-investment](https://www.ofgem.gov.uk/publications/consultation-accelerating-onshore-electricity-transmission-investment)

Consultation stages

Stage 1	Stage 2	Stage 3	Stage 4
Consultation open	Consultation closes (awaiting decision). Deadline for responses	Responses reviewed and published	Consultation decision/policy statement
10/03/2023	07/04/2023	04/2023	05/2023

How to respond

- 1.17 We want to hear from anyone interested in this consultation. Please send your response to the person or team named on this document’s front page.
- 1.18 We have asked for your feedback in each of the questions throughout. Please respond to each one as fully as you can.

1.19 We will publish non-confidential responses on our website at www.ofgem.gov.uk/consultations.

Your response, data and confidentiality

- 1.20 You can ask us to keep your response, or parts of your response, confidential. We will respect this, subject to obligations to disclose information such as under the Freedom of Information Act 2000, the Environmental Information Regulations 2004, statutory directions, court orders, government regulations or where you give us explicit permission to do so. If you do want us to keep your response confidential, please clearly mark this on your response and explain why.
- 1.21 If you wish us to keep part of your response confidential, please clearly mark those parts of your response that you *do* wish to be kept confidential and those that you *do not* wish to be kept confidential. Please put the confidential material in a separate appendix to your response. If necessary, we will get in touch with you to discuss which parts of the information in your response should be kept confidential, and which can be published. We might ask for reasons why.
- 1.22 If the information you give in your response contains personal data under the General Data Protection Regulation (Regulation (EU) 2016/679) as retained in domestic law following the UK’s withdrawal from the European Union (“UK GDPR”), the Gas and Electricity Markets Authority will be the data controller for the purposes of GDPR. Ofgem uses the information in responses in performing its statutory functions and in accordance with section 105 of the Utilities Act 2000. Please refer to our Privacy Notice on consultations contained within appendix 1.
- 1.23 If you wish to respond confidentially, we will keep your response confidential but we will publish the number (but not the names) of confidential responses we receive. We will not link responses to respondents if we publish a summary of responses, and we will evaluate each response on its own merits without undermining your right to confidentiality.

General feedback

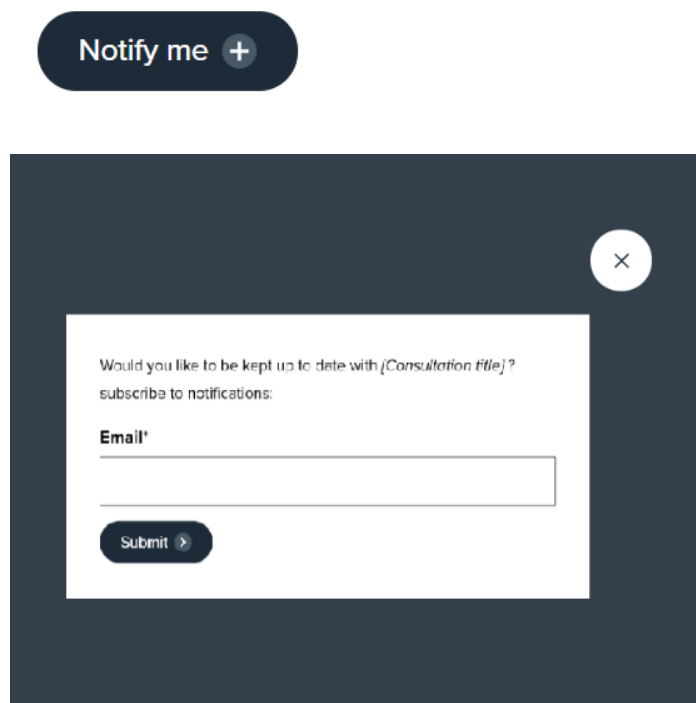
- 1.24 We believe that consultation is at the heart of good policy development. We welcome any comments about how we have run this consultation. We would also like to get your answers to these questions:
- 1) Do you have any comments about the overall process of this consultation?
 - 2) Do you have any comments about its tone and content?

- 3) Was it easy to read and understand? Or could it have been written better?
- 4) Were its conclusions balanced?
- 5) Did it make reasoned recommendations for improvement?
- 6) Any further comments?

1.25 Please send any general feedback comments to stakeholders@ofgem.gov.uk

How to track the progress of the consultation

1.26 You can track the progress of a consultation from upcoming to decision status using the 'notify me' function on a consultation page when published on our website, [Ofgem.gov.uk/consultations](https://www.ofgem.gov.uk/consultations)



1.27 Once subscribed to the notifications for a particular consultation, you will receive an email to notify you when it has changed status. Our consultation stages are:

1.28 **Upcoming** > **Open** > **Closed** (awaiting decision) > **Closed** (with decision)

2. Yorkshire GREEN Final Needs Case assessment

Section summary

This chapter sets out the key decisions NGET has made to date on the Yorkshire GREEN project. It also describes our assessment of their approach and explains our findings on the technical need, options, and CBA for the project.

Questions

- Q1. Do you agree with the technical need for investment on the transmission network?
- Q2. Do you agree with our conclusions on the technical options considered?
- Q3. Do you agree with our conclusions on the CBA and the appropriateness of the option taken forward?

Overview of NGET’s proposal

2.1 NGET proposes to reinforce the B7a and B8 boundaries in the North of England to facilitate the anticipated increase in North to South power transfers due to proposed renewable power generation in Scotland and the North Sea. The project is also important in maximising the benefits of the Eastern HVDC link (E2DC) project¹⁹ and in facilitating the safe connection of offshore wind generators as part of the ESO’s Holistic Network Design (HND)²⁰.

2.2 Figure 2 presents Yorkshire GREEN’s scope of work which consists of:

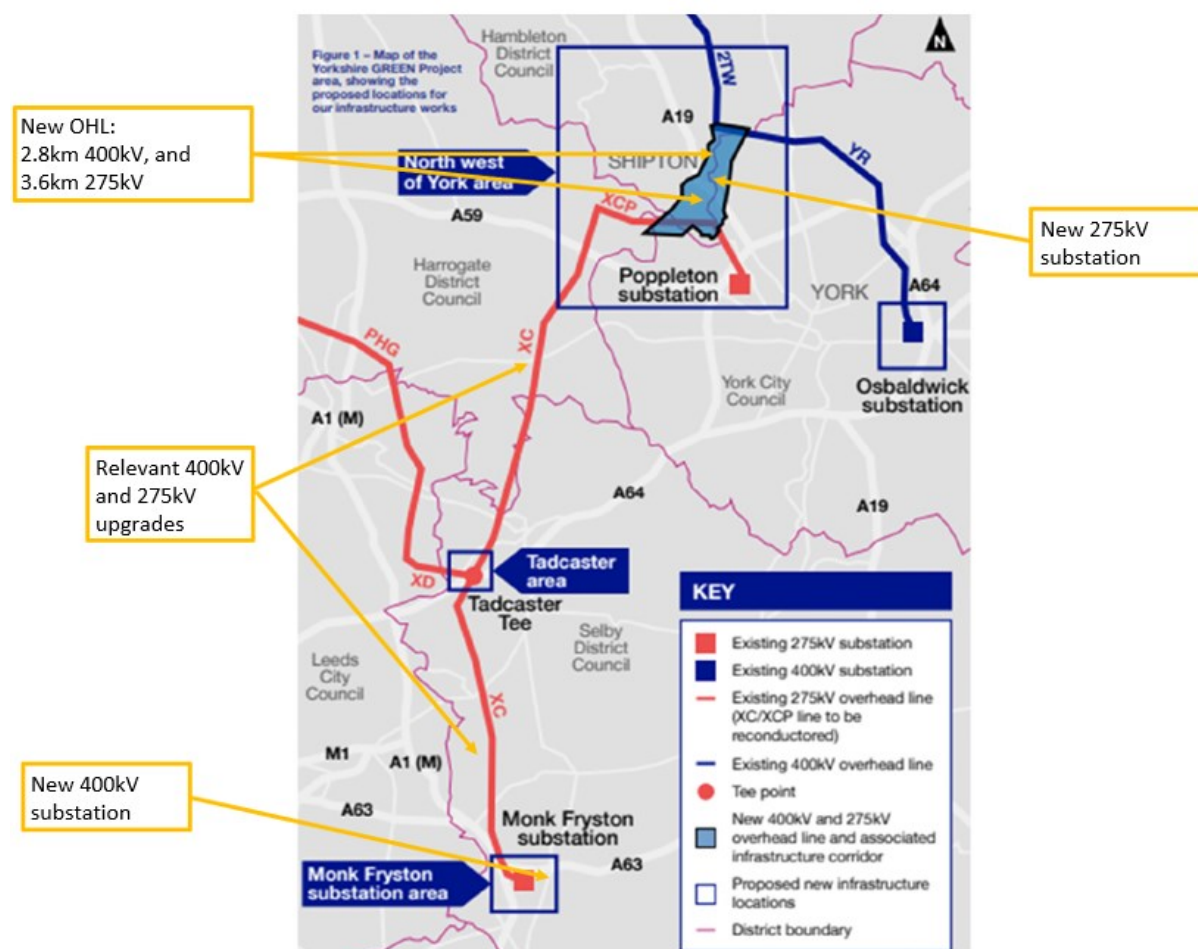
- New 400kV substation extension at Monk Fryston, inclusive of protection and control of transformers to connect back into the existing 275kV substation;
- New 275kV substation to be installed at Overton, inclusive of transformers, protection, and control sited off the existing XCP overhead lines (OHL) route. XCP OHL shall be renamed to XC (west of Overton) and SP (East of Overton);
- c.6.4km of new OHL, 2.8km at 400kV and 3.6km at 275kV, connecting the existing YR OHL with Overton substation, and Overton substation to the existing 275kV OHL; and

¹⁹ Appendix 2 diagrammatically presents the two HVDC links (E2DC and E4D3) that make up the Eastern HVDC project

²⁰ [The Pathway to 2030 Holistic Network Design](#)

- Relevant 400kV and 275kV upgrades.

Figure 2: Scope of preferred option, OPN2, for Yorkshire GREEN



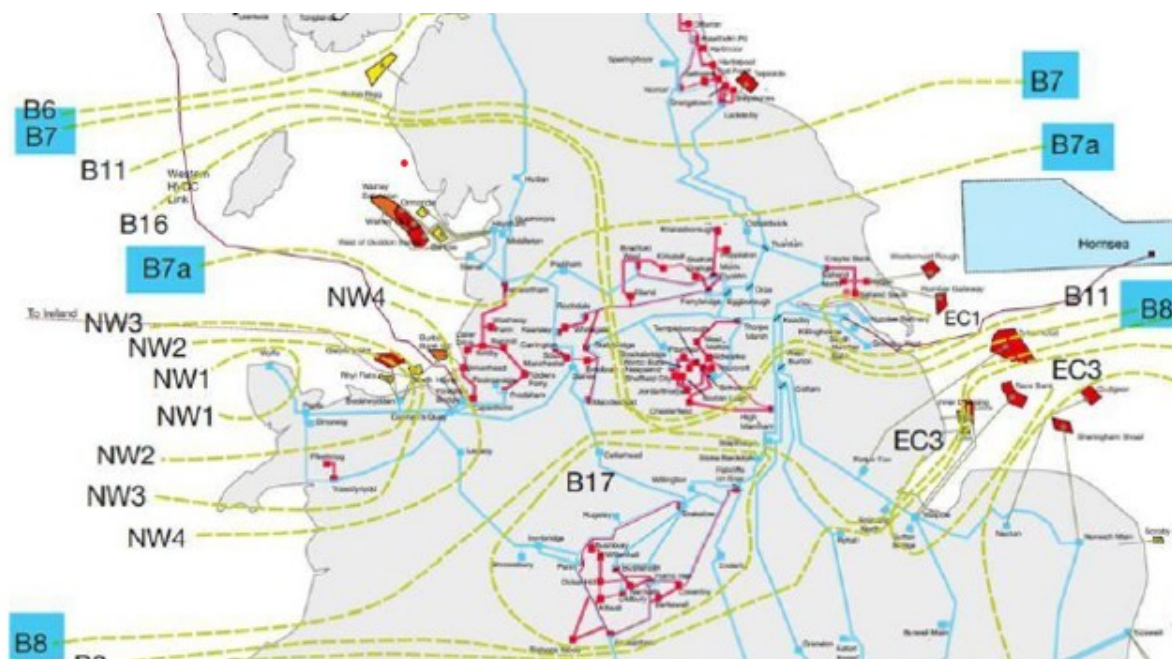
Why the project has been brought forward

2.3 In line with Net Zero targets, an expansion in the growth of renewable generation is expected in the North of England and Scotland over the next decade. Without reinforcement, the transmission network in the North of England could become strained requiring constraint action²¹ from the ESO to maintain secure and safe system operation. Such action from the ESO would result in costs (i.e. constraint costs) which ultimately feed into consumer bills.

²¹ When transmission capability is insufficient to support required electricity flow, this is known as a constraint. The ESO manages these constraints by taking actions - by paying generators (or demand) in different locations to change their output (or consumption), thus changing the flow on the network. The amount the ESO pays network users to manage constraints in this way is known as the constraint cost.

2.4 The ESO’s Electricity Ten Year Statement (ETYS)²² and the NOA refresh published alongside the HND have shown the need for investment across multiple northern transmission boundaries of Great Britain²³. Specifically relevant to Yorkshire GREEN, the ETYS shows that the current capability of network boundaries B7a and B8 are unlikely to be sufficient to accommodate future network requirements. Figure 3 shows major boundaries B7²⁴, B7a, and B8 within NGET’s network in the north of England.

Figure 3: Boundaries B7, B7a, and B8



2.5 In three of the four 2021 FES, namely System Transformation, Consumer Transformation, and Leading the Way, the required boundary transfers will be well above the current boundary capability by mid-2020. In the fourth scenario, Steady Progression, this will occur by late 2020.

2.6 To relieve these constraints on the affected boundaries and reduce the consequential constraint costs, NGET put forward potential solutions to be

²² The [Electricity Ten Year Statement](#) (ETYS) is the ESO’s annual view of future transmission requirements and the capability of Great Britain’s National Electricity Transmission System over the next decade

²³ [Electricity Ten Year Statement](#) (ETYS) is the ESO’s annual view of future transmission requirements and the capability of Great Britain’s National Electricity Transmission System over the next decade; and the [Network Option Assessment](#) (NOA) provides the ESO’s recommendation for which network reinforcement projects should receive investment and when

²⁴ For the purposes of the studies and input into the NOA, boundary B7 was not studied as it is similar to boundary B7a which has been studied

compared within the ESO’s NOA process. The NOA assesses investment options and makes recommendations on which options to progress further, to pause, or to stop. In the case of those proposed investments that qualify for the LOTI mechanism, those projects are subject to a further comparative CBA run by the ESO that is used to support the LOTI submission that the TO, NGET in this case, made to us. The CBA considers options in a greater level of detail, considering factors such as route location, delivery timing, and local as well as wider supply and demand forecasts and trends.

- 2.7 The E2DC project, the first of the two Eastern HVDC links and a separate project currently under consideration by Ofgem²⁵, has close interactions with Yorkshire GREEN. The full boundary benefits of E2DC will be realised when Yorkshire GREEN is delivered. The most updated constraint cost analysis from the ESO indicates that if E2DC is delivered in 2027, the cost of a single year delay to Yorkshire GREEN would range from £370m to £606m across the FES.

Options considered

- 2.8 Our INC consultation laid out NGET’s approach²⁶ to arrive at their preferred option, OPN2. We were satisfied that NGET provided a clear account of the options considered and the process followed to select their preferred option. We did note that their preferred option’s scope increased which subsequently increased costs, but we did not receive a detailed technical report to account for this. We stated, as per paragraph 3.30 in the INC consultation, that we expect to receive this technical report as part of NGET’s FNC submission.
- 2.9 NGET provided us with the technical report in their FNC submission. Furthermore, project refinement of OPN2 has led to a revision of costs. This revision is a result of a reduction in cabling totalling £97m and a saving of £20m as power control systems are no longer required. The reduction is slightly offset by some additional scope and capital expenditure (capex) items being identified during the refinement stage. Overall, NGET's cost savings has reduced the project's capex from £392m as reported in NGET’s INC submission to a current cost of £298m.

²⁵ [Eastern HVDC – Conditional Decision on the projects’ Final Needs Case](#)

²⁶ [Yorkshire GREEN – Consultation on the project’s Initial Needs Case and initial thinking on its suitability for competition](#), paragraphs 3.11-3.19

2.10 OPN2 continues to be NGET’s preferred option, primarily due to OPN2’s delivery time and favourable route lengths.

CBA process

2.11 The CBA for Yorkshire GREEN compares the likely benefits (in terms of reductions in future constraint costs) across the ESO’s FES 2021 scenarios versus the costs (in terms of estimated capital costs) of the shortlisted investment options.

2.12 Table 1 presents the options tested in the CBA as well as their earliest in-service dates (EISD) which are used to show the earliest year a network reinforcement option can be feasibly delivered. A short summary of these options is:

- Yorkshire GREEN (OPN2);
- Yorkshire GREEN variants (OPN1, 4, 5); and
- Options that were less costly than all OPN options and that also performed best within the INC (i.e. the Back Check and Review options: BCR1 and 2).

Table 1: Options considered in the CBA

Option	Description	EISD	Capex (20/21 prices)
OPN1	<p>New 400kV double circuit OHL from Norton - Osbaldwick circuit to Poppleton substation.</p> <p>New 400kV substation at Poppleton. Uprate XCP / XC line to 400kV will require a new 400kV OHL to be built between the new Poppleton 400kV substation and a new 400kV substation at Monk Fryston.</p> <p>New 400kV substation at Tadcaster Tee to bring in the XD route to Knaresborough.</p>	2029	£644m
OPN2	<p><i>Refined scope:</i></p> <p>New 400kV substation extension at Monk Fryston, inclusive of protection and control of transformers to connect back into the existing 275kV substation.</p> <p>New 275kV substation to be installed at Overton inclusive of transformers, protection, and control sited off the existing XCP overhead lines (OHL) route. XCP OHL shall be renamed to XC (west of Overton) and SP (East of Overton).</p> <p>c.6.4km of new OHL, 2.8km at 400kV and 3.6km at 275kV, connecting the existing YR OHL with Overton substation, and Overton substation to the existing 275kV OHL.</p> <p>Relevant 400kV and 275kV upgrades.</p>	2027	£298m
OPN4	As per OPN2 with an underground cable from Norton to Osbaldwick.	2027	£514m
OPN5	As per OPN2 with a new 400kV York North substation.	2028	£414m
BCR1	Option identified by NGET’s Back Check and Review exercise.	2030	£284m
BCR2	Option identified by NGET’s Back Check and Review exercise.	2030	£296m

CBA results

- 2.13 All the options tested in the CBA displayed high Net Present Values (NPVs). Due to this, all options deliver benefits to consumers because the estimated avoided constraint costs are significantly higher than the capex costs associated with delivering each option.
- 2.14 The NPVs range between £0.9bn and £2.9bn across the FES. OPN2 produces the highest NPV in each scenario and is therefore the Least-Worst Regret (LWR) option.
- 2.15 The LWR methodology requires that design preference is based on the option that is least likely to result in an adverse outcome and minimises the risk to consumers across all the backgrounds considered by the FES. The underlying philosophy is that it is advantageous to pick the solution that has the lowest adverse consequence of being wrong across the range of eventualities, given uncertainties in forecasts and assumptions. This approach seeks to ensure that particularly unfavourable combinations are avoided. It also assumes that all eventualities are possible at the investment decision stage. The LWR philosophy can be seen as minimising risk in the face of an uncertain future where some sort of probability distribution cannot be surmised.
- 2.16 Table 2 below shows the CBA results for all options.

Table 2: CBA results

Regret (£m)	CT	LW	SP	ST	Worst Regret	Rank
OPN1	1428.66	1300.94	1151.43	1374.83	1428.66	5
OPN2	0.00	0.00	0.00	0.00	0.00	1
OPN4	207.49	207.49	207.49	207.49	207.49	2
OPN5	725.19	678.57	489.48	701.43	725.19	3
BCR1: 4ZR-OSB/THO-4VJ-DRA/EGG-OAC	2524.79	3153.36	1167.81	1725.49	3153.36	6
BCR2: 4ZR-OSB/THO-4YS-MON/EGG-OAC	1221.78	973.48	1058.32	1227.17	1227.17	4

- 2.17 In addition to the CBA results referred to above, various sensitivity analyses were performed by the ESO. The results are summarised in table 3 below. Full results can be found in appendix 3.

Table 3: CBA sensitivity analysis summary

Sensitivity	Result
<p>Delay to preferred option:</p> <p>OPN2 was tested with delays of 1, 2, and 3 yrs.</p> <p>E2DC was tested with delays of 1 and 2 yrs.</p> <p>OPN2 and E2DC were tested with delays of 1 and 2 yrs occurring concurrently</p>	<p>Delays to OPN2 and/or E2DC makes OPN4 the LWR option; however:</p> <p>1. As OPN4 is a variant of OPN2, if OPN2 is delayed and cannot deliver to its EISD, OPN4 would be subject to the same delays; and</p> <p>2. As OPN2 is cheaper than OPN4 and both offer the same constraint costs savings, a delay to E2DC would result in less regret for OPN2 versus OPN4 given OPN4’s high capex.</p>
<p>Capital and constraint cost sensitivities:</p> <p>Tested with a variance of +/- 10%.</p>	<p>Varying costs for all options simultaneously does not alter the LWR rankings. OPN2 remains the optimal option.</p>

Our views on the Yorkshire GREEN project

Project drivers

- 2.18 We agree with the need for reinforcement on the B7a and B8 boundaries to ensure that the electricity generated by anticipated new renewable energy to achieve Net Zero, particularly in Scotland and the North of England, can be transferred efficiently to where it is needed without being constrained.
- 2.19 We also agree that Yorkshire GREEN is part of the enabling works to fully realise the benefits of the E2DC link.

Options considered

- 2.20 We noted in our INC consultation²⁷ that NGET provided a clear account of the options initially considered, as set out in table 1 above, and the process followed to select its preferred option, OPN2. We stated that we are comfortable that NGET responded to NOA signals in a reasonable manner to ensure that appropriate options could be assessed in a timely manner, and NGET also set out its most

²⁷ [Yorkshire GREEN – Consultation on the project’s Initial Needs Case and initial thinking on its suitability for competition](#), paragraph 3.29

realistic delivery dates which is an important factor for this project. Specifically, we considered that NGET made rational judgements on the impact that alternative options with longer cable lengths could have on routing and consents as well as the loss of constraint savings in pursuing cheaper options with later EISD’s that were shortlisted.

- 2.21 NGET provided the technical report we requested in our INC decision²⁸ with respect to explaining the increasing scope and costs of its preferred option. We evaluated this report as part of the FNC submission and we are satisfied with its findings. In particular, NGET’s refinement of their preferred option has resulted in cost savings of c.£94m since their INC submission which has reduced the project’s cost from £392m down to £298m. NGET has also further demonstrated that their technical design choice results in OPN2 continuing to remain the optimal solution.

CBA results

- 2.22 We noted in our INC consultation²⁹ that NGET selected a sufficiently broad range of options to be tested in the CBA. This included the initial option, OENO, as well as variants of the preferred option, OPN2, and other shortlisted lower capital cost options as set out in table 1 above. Our view was that the CBA supports the need for investment on this part of the network and justifies NGET’s progression of OPN2 as the preferred option. OPN2 displays the highest NPV across each FES scenario and is clearly the LWR option.
- 2.23 The cost of OPN2 reduced in the FNC submission and although this benefits the project, the relative benefits associated with OPN2 are largely driven by its earlier EISD compared to the other options. As such, we note that the differences in EISDs across the options have been reasonable justified and we are satisfied with this.
- 2.24 We continue to be content that although OPN2 is not the lowest capital cost option, it does represent the most economic and efficient solution due to its overall constraint cost savings relative to the lowest cost options. Given the

²⁸ [Yorkshire GREEN – Decision on the project’s Initial Needs Case and initial thinking on its suitability for competition](#), paragraph 2.11

²⁹ [Yorkshire GREEN – Consultation on the project’s Initial Needs Case and initial thinking on its suitability for competition](#), paragraph 3.32

material impact of EISDs, we expect NGET to continue to progress Yorkshire GREEN in a timely manner to ensure that its benefits are fully realised.

- 2.25 Finally, we are comfortable that OPN2 remains the most appropriate option under a reasonable range of tested sensitivities.

Consideration under ASTI arrangements

- 2.26 As explained in our ASTI decision, by including the Yorkshire Green project within the list of ASTI projects, we are accepting the needs case for the project in terms of the technical capabilities reflected in the HND/NOA Refresh. This is not an equivalent level of approval to an FNC approval under LOTI. The needs case approval under ASTI recognises that a lot of the projects within ASTI will continue to evolve and change as they progress through the planning process and see their designs become more detailed too. The FNC approval under LOTI is designed to specifically come after the design of the project has been finalised and the planning consents secured.
- 2.27 NGET expect to secure planning consents for the Yorkshire Green project in February 2024. Aside from any final amendments through the planning process, we do not expect the consented design for the project to significantly change from NGET’s current design. Once the ASTI arrangements have been implemented into NGET’s licence, the project will be subject to ASTI arrangements. As such, we will assess any such changes to NGET’s current detailed project design choices when we will undertake a full ASTI project assessment (ASTI PA) for the project.

3. Delivery via a competition model

Section summary

This chapter summarises our assessment of whether the Yorkshire GREEN project meets the criteria for competition and explains our minded-to decision on whether to apply a late competition model to Yorkshire GREEN.

Background

- 3.1 Competition in the design and delivery of energy networks is a central aspect of the RIIO-2 price control. Competition has a key role to play in driving innovative solutions and efficient delivery that can help meet the decarbonisation targets at the lowest cost to consumers. We set out in our Final Determinations³⁰ for RIIO-2 that during the RIIO-2 period, all projects that meet the criteria for competition and are brought forward under an uncertainty mechanism³¹ will be considered for potential delivery through a late competition model.
- 3.2 The majority of the Yorkshire Green project meets the criteria for late model competition and these elements could be separated into a ‘repackaged’ project that could be considered for late model competition. This is in line with the National Grid Electricity System Operator’s (ESO) view as per their published Network Options Assessment (NOA)³² 2021/22 Refresh. The ESO’s approach also aligns with our own principles for ‘project packaging’ as set out in previous competition policy decisions.
- 3.3 However, in our December 2022 ASTI decision we decided that all projects within the ASTI regime, which includes the Yorkshire Green project, will be exempt³³ from consideration for delivery via a competition model. On that basis, we have not assessed the project’s suitability for competition under the LOTI regime.
- 3.4 We are seeking to finalise the licence amendments to NGET’s licence to implement the ASTI regime later this year.

³⁰ [RIIO-2 Final Determinations](#), Core Document (REVISED), chapter 9

³¹ [Large Onshore Transmission Investments \(LOTI\) Re-opener Guidance](#), pages 9-11

³² [Network Options Assessment \(NOA\)](#) - Download the NOA publication (Read NOA 2021/22 Refresh report) - page 26. Please note that the Yorkshire GREEN project is listed as project OPN2

³³ [Decision on accelerating onshore electricity transmission investment](#), table 4. Please note that the Yorkshire GREEN project is listed as project OPN2

4. Large project delivery

Section summary

This chapter sets out the large project delivery options for the Yorkshire GREEN project and our minded-to decision.

Background

- 4.1 In the RIIO-2 Final Determinations³⁴, we set out our approach to late delivery of large projects (i.e. >£100m). The aim of this approach is to ensure that a network company does not benefit financially from a delay to project delivery.
- 4.2 We aim to ensure consumers are protected from any delay in delivery. To this end, we consider setting a Project Delivery Charge (PDC) for each day a project is delivered late.
- 4.3 In our December 2022 ASTI decision we decided that all projects within the ASTI regime, which includes the Yorkshire Green project, will be subject to an output delivery incentive³⁵ that rewards / penalises the TOs for delivery against target delivery dates. Based on this, we have not assessed the application of a PDC to the Yorkshire Green project.
- 4.4 We are seeking to finalise licence amendments to NGET’s licence in order to implement the ASTI arrangements later this year.

³⁴ [RIIO-2 Final Determinations](#), ET Annex (REVISED), page 32 onwards

³⁵ [Decision on accelerating onshore electricity transmission investment](#), chapter 7, table 10. Please note that the Yorkshire GREEN project is listed as project OPN2

5. Next steps

Section summary

This chapter sets out the next steps in our assessment of the Yorkshire GREEN project under the LOTI mechanism.

- 5.1 Our consultation on the positions set out within this document will close on 07 April 2023. We currently anticipate publishing our FNC decision in Spring 2023.
- 5.2 Once the FNC stage is complete and a decision has been made, the next phase will be the PA stage.

Appendices

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Appendix 1 - Privacy notice on consultations

Personal data

The following explains your rights and gives you the information you are entitled to under the General Data Protection Regulation (GDPR).

Note that this section only refers to your personal data (your name address and anything that could be used to identify you personally). It does not refer to the content of your response to the consultation.

1. The identity of the controller and contact details of our Data Protection Officer

The Gas and Electricity Markets Authority is the controller (“Ofgem” for ease of reference). The Data Protection Officer can be contacted at dpo@ofgem.gov.uk

2. Why we are collecting your personal data

Your personal data is being collected as an essential part of the consultation process so that we can contact you regarding your response and for statistical purposes. We may also use it to contact you about related matters.

3. Our legal basis for processing your personal data

As a public authority, the GDPR makes provision for Ofgem to process personal data as necessary for the effective performance of a task carried out in the public interest, i.e. a consultation.

4. With whom we will be sharing your personal data

N/A.

5. For how long we will keep your personal data or the criteria used to determine the retention period.

Your personal data will be held for six months after the project is closed.

6. Your rights

The data we are collecting is your personal data and you have considerable say over what happens to it. You have the right to:

- know how we use your personal data,
- access your personal data,
- have your personal data corrected if it is inaccurate or incomplete,
- ask us to delete your personal data when we no longer need it,
- ask us to restrict how we process your personal data,
- get your personal data from us and re-use it across other services,
- object to certain ways we use your personal data,
- be safeguarded against risks where decisions based on your personal data are taken entirely automatically,
- tell us if we can share your personal information with 3rd parties,
- tell us your preferred frequency, content and format of our communications with you,
- lodge a complaint with the independent Information Commissioner (ICO) if you think we are not handling your personal data fairly or in accordance with the law. You can contact the ICO at <https://ico.org.uk/> or telephone 0303 123 1113.

7. Your personal data will not be sent overseas.

8. Your personal data will not be used for any automated decision making.

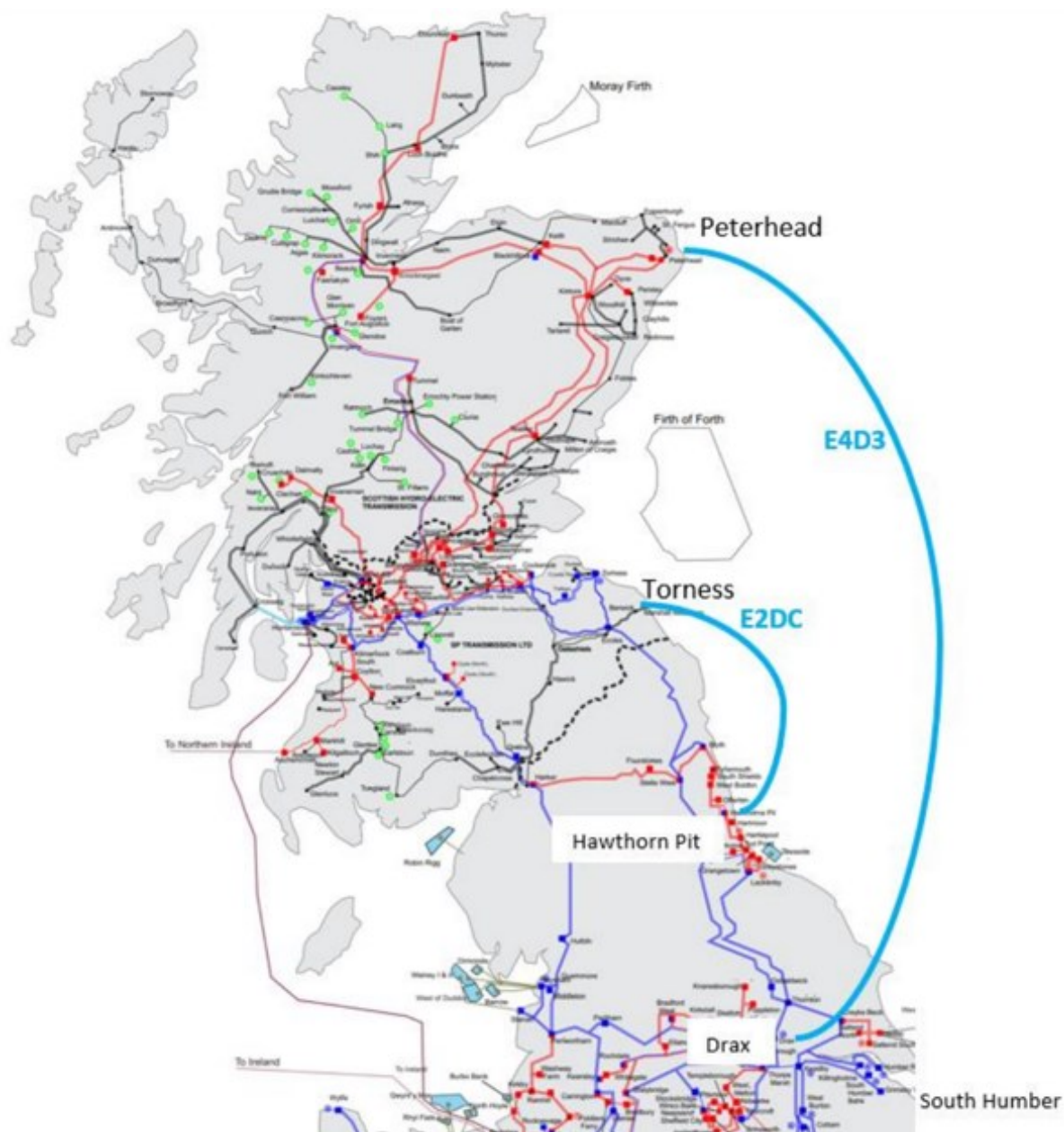
9. Your personal data will be stored in a secure government IT system.

10. More information

For more information on how Ofgem processes your data, click on "[Ofgem privacy promise](#)".

Appendix 2 - TOs preferred scheme for Eastern HVDC

Progression of two HVDC links



A2.1 The TOs preferred option for the Eastern HVDC project is the progression of two HVDC links:

- c.£1.3bn subsea link of 2GW capacity from Torness to a connection point on the existing network at Hawthorn Pit (E2DC) to be delivered by 2027; and
- c.£2.1bn subsea link of 2GW capacity from Peterhead to a connection point on the existing network at Drax (E4D3) to be delivered by 2029.

Appendix 3 - CBA sensitivity analysis: full summary

OPN2 and E2DC delay sensitivity

Regret (£m)	CT	LW	SP	ST	Worst Regret	Rank
OPN1	1428.66	1300.94	1151.43	1374.83	1428.66	12
OPN2	0.00	0.00	0.00	0.00	0.00	1
OPN4	207.49	207.49	207.49	207.49	207.49	2
OPN5	725.19	678.57	489.48	701.43	725.19	6
BCR1: 4ZR-OSB/THO-4VJ-DRA/EGG-OAC	2524.79	3153.36	1167.81	1725.49	3153.36	13
BCR2: 4ZR-OSB/THO-4YS-MON/EGG-OAC	1221.78	973.48	1058.32	1227.17	1227.17	10
OPN2 1 year delay	605.90	559.28	370.19	582.14	605.90	4
OPN2 2 year delay	1113.84	1085.94	838.01	1081.18	1113.84	8
OPN2 3 year delay	1344.00	1263.41	1046.27	1272.62	1344.00	11
OPN2 with E2DC one year delay	437.29	438.08	242.58	416.99	438.08	3
OPN2 with E2DC two year delay	809.89	837.48	499.35	784.56	837.48	7
OPN2 1 year delay & E2DC 1 year delay	648.32	612.60	389.01	617.14	648.32	5
OPN2 2 year delay & E2DC 2 year delay	1198.63	1191.56	843.28	1157.64	1198.63	9

Capital cost and constraint sensitivity summary

	Main options	CAPEX 110%	CAPEX 90%	Constraints 110%	Constraints 90%
OPN1	5	5	5	5	5
OPN2	1	1	1	1	1
OPN4	2	2	2	2	2
OPN5	3	3	3	3	3
BCR1: 4ZR-OSB/THO-4VJ-DRA/EGG-OAC	6	6	6	6	6
BCR2: 4ZR-OSB/THO-4YS-MON/EGG-OAC	4	4	4	4	4