

1 Introduction

1.1 Introduction

1.1.1 This Environmental Impact Assessment Report (EIAR) has been prepared by AECOM on behalf of SP Transmission Plc and SP Distribution Plc, (also referred to in this EIAR as ‘the Applicant’). It accompanies the following consent applications:

- Under the Town and Country Planning (Scotland) Act 1997(Ref 1.1) for planning permission for a new substation, known as Kincardine North Substation including works to upgrade Hawkhill Road (also referred to in this EIAR as ‘KINN’);
- Under section 37 of the Electricity Act 1989 (Ref 1.2) and deemed planning permission under section 57 of the Town and Country Planning (Scotland) Act 1997 for consent to upgrade and modify three existing overhead lines: proposed XL Route Upgradeⁱ proposed ZCN Route Upgrade and proposed ZCS Route Upgrade (also referred collectively to in this EIAR as ‘Overhead Line Works’);
- Under the Town and Country Planning (Scotland) Act 1997 for planning permission for the removal of existing 11kV wood pole overhead lines and replacement with 11kV underground cables and associated works (referred to in this EIAR as ‘Scottish Power Distribution Works’.)

1.1.2 The above applications are collectively referred to as the ‘Central Scotland 400 kilovolt (kV) Upgrade, or the ‘Proposed Development’ throughout this EIAR. For the purposes of illustrating the location of the Proposed Development an ‘EIA Boundary’ has been defined based on the application boundaries for the above consent applications. The EIA Boundary is illustrated in Figure 1.1 Site Location.

1.1.3 It should be noted that XL route extends north/northeast from SP Transmission’s licence area forming part of a continuous overhead line route which extends into SHE Transmission’s licence area. Each Transmission Licence Holder is responsible for upgrading the existing overhead line route within its licence area. Consent has already been granted for the upgrade in the SHE Transmission licence area (referred to in this EIAR as the ‘SHE Transmission Works’) (reference ECU00002132). The combined likely significant environmental effects of the Proposed Development and the consented SHE Transmission Works are considered in chapter 15 of this EIAR.

1.1.4 The EIAR describes the identification and assessment of the likely significant environmental effects of the Proposed Development (Chapters 6 to 13). It also considers the combined likely significant effects resulting from the Proposed Development and the SHE Transmission Works (Chapter 15). The EIAR sets out the results of the EIA to enable statutory consultees and decision-makers to consider these as part of the determination of the consent applications.

1.2 Background to and Need for the Proposed Development

Background

- 1.2.1 The UK and Scottish Governments have set legally binding targets to reach net zero in greenhouse gas emissions and end their contributions to climate change by 2050 and 2045 in the Climate Change Act 2008 (Ref 1.3) and Climate Change (Scotland) Act 2009 (Ref 1.4) respectively. Decarbonisation of the energy sector is a central pillar of both governments' net zero strategies meaning the way in which energy is generated, transported and used is undergoing transformational change. Traditional fossil fuel-based forms of generation are being retired and replaced by renewable and low carbon sources of energy generation including onshore and offshore wind as well as being supported by increased interconnection with Europe.
- 1.2.2 With electricity demand predominantly located in the south of the country and considerable renewable energy resources in the north this leads to high north-south power flows on the electricity transmission system. Reflecting prevailing policy objectives and the pipeline of offshore wind and other renewable energy projects in Scotland this requires an increase in north-south electricity transmission capability so that energy can be transported to areas of increased demand further south in the UK.
- 1.2.3 SP Transmission plc (SPT), the Transmission Owner (TO) and Licence Holder responsible for the electricity transmission network in central and southern Scotland has a crucial role to play. Its transmission network enables the bulk transfer of renewable energy generated within its licence area as well as within SHE Transmission's (SHET) licence area to the north, south to National Grid Electricity Transmission's (NGET) licence area and large centres of demand.

Need for the Proposed Development

- 1.2.4 The National Energy System Operator (NESO) is responsible for the planning and operation of the high voltage electricity transmission system across Great Britain. They undertake a number of activities on an annual basis to ensure the economic and efficient operation of the electricity transmission system. This includes the Network Options Assessment(Ref 1.5)(NOA), an economic assessment of projects proposed by TOs including the Applicant to provide network capacity and meet the future needs of the electricity transmission network. The analysis in NOA allows recommendations to be made as to which projects will be economic and efficient to develop and the optimal timing of those projects.
- 1.2.5 The Proposed Development is part of a number of upgrades and new reinforcements that will provide additional transmission capability enabling renewable energy generated in north and central Scotland to be transmitted from SHET's licence area to SPT's and beyond.
- 1.2.6 The Proposed Development forms part of a coordinated programme of network reinforcements identified through the National Energy System Operator's (NESO) strategic planning processes, including the Network Options Assessment (NOA) (Ref 1.5), which recommends the most economic and efficient transmission investments required to accommodate forecast generation and demand across Great Britain. These assessments consistently identify the

need to increase north-to-south transfer capability across Scotland, driven by the rapid growth of renewable generation—particularly offshore wind—in the north and central regions, where generation capacity significantly exceeds local demand and is expected to continue to do so.

- 1.2.7 Within this wider strategic context, the Proposed Development contributes to the reinforcement of the electricity transmission system helping to facilitate the bulk transfer of renewable electricity southwards, relieve existing transmission constraints and enable efficient utilisation of low-carbon generation. Without such upgrades, physical limitations on the network would continue to result in increased constraint management actions, including curtailment of renewable generation and associated system costs to consumers, thereby reducing overall network efficiency.
- 1.2.8 Specifically, the development supports the progressive transition of the central Scotland network from 275 kV to 400 kV operation, increasing circuit capacity and strengthening network resilience, while also enabling integration of new and existing generation connections. This aligns with NOA recommendations (Ref 1.5) for reinforcement projects that enhance transfer capability across key system boundaries and ensure compliance with national Security and Quality of Supply Standards (SQSS).
- 1.2.9 Furthermore, the Proposed Development directly supports the UK Government’s Clean Power 2030 ambitions and associated delivery frameworks, including the Holistic Network Design and wider “Pathway to 2030” initiatives (Ref 1.6), which require substantial and timely investment in transmission infrastructure to connect and transport large volumes of renewable generation. By enabling the efficient transfer of electricity from SSE’s licence area into SPT’s network and onwards to demand centres in the UK, the project plays a critical role in establishing an integrated, high-capacity transmission system capable of supporting a decarbonised electricity system.
- 1.2.10 The Kincardine North Substation, together with the overhead line uprating works, is required to increase network capability through the transition from 275 kV to 400 kV operation and to create a stronger, more integrated node within the transmission system. This will enable the efficient transfer of electricity from areas of generation in the north and central Scotland into the wider network, reduce constraint-related limitations on the system and support the secure and reliable operation of the network in line with national policy objectives for decarbonisation and Clean Power 2030.

1.3 About the Applicant

- 1.3.1 SP Energy Networks (SPEN) is the trading name for Scottish Power Energy Networks Holdings Limited. SPEN owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly-owned subsidiaries SP Transmission plc and SP Distribution plc. These businesses are ‘asset-owner companies’ holding the regulated assets and Electricity Transmission and Distribution Licences. SP Transmission plc is the Transmission Licence holder under the Electricity Act 1989 (Ref 1.2).

- 1.3.2 As the holder of transmission and distribution licences under the Electricity Act 1989 (Ref 1.2), the Applicant is subject to a number of statutory duties and licence obligations. These include requirements “to develop and maintain an efficient, coordinated and economical system of electricity transmission” and “to facilitate competition in the generation and supply of electricity”. This requires the Applicant to provide for new electricity generators such as wind farm developers wishing to connect to the transmission system in its licence area; to make its transmission system available for these purposes and to ensure that the transmission system is fit for purpose through appropriate reinforcements to accommodate the contracted capacity.
- 1.3.3 In addition, in formulating proposals for electricity transmission infrastructure, the Applicant is subject to duties under Schedule 9 of the Electricity Act 1989 (Ref 1.2) to: (a) *“have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and, (b) ... do what it reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.”*
- 1.3.4 The consent applications for the Proposed Development have been prepared on behalf of and made by SP Transmission taking into account its statutory duties and licence obligations under the Electricity Act 1989 (Ref 1.2) as outlined above.

1.4 The EIA Team

- 1.4.1 Regulation 5(5) of the EIA Regulations requires developers to ensure that EIA Reports are prepared by competent experts and accompanied by a statement outlining the relevant expertise or qualifications of such experts. Below sets out an overview with further details within Appendix 1.1.
- 1.4.2 With the exception of the operational noise assessment for the Overhead Line Works, which has been prepared by Wood Plc, the EIAR has been co-ordinated, prepared and reviewed by AECOM on behalf of the Applicant.
- 1.4.3 AECOM is registered to the EIA Quality Mark, which is a scheme operated by the Institute of Sustainability & Environmental Professionals (ISEP) that allows organisations (both developers and consultancies) that lead the co-ordination of statutory EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed. The Quality Mark demonstrates that AECOM’s EIAs and wider EIA-related practices are independently rated and regularly monitored to high standards.
- 1.4.4 Wood Plc is recognised for strong commitment to high operational standards, demonstrated through its ISO 14001 environmental certification, its professional memberships and its Lloyds approved ISO 9001 quality management system. In addition, Wood holds ISO 27001 certification for information security and ISO 45001 for occupational health and safety, further highlighting its focus on secure, safe and responsibly managed project delivery.

1.5 EIA and Consenting Requirements

Kincardine North Substation

- 1.5.1 KINN requires planning permission from Fife Council under the Town and Country Planning (Scotland) Act 1997 (Ref 1.1). While the majority of KINN is located within Fife, a small proportion to the west, including the proposed temporary access from the A876, is located within Clackmannanshire. The planning application includes proposed upgrades to Hawkhill Road to enable safe and efficient construction traffic access.
- 1.5.2 Clackmannanshire Council granted permission (ref: 25/00209/FULL) for proposals relating to Kincardine North Substation in February 2026. Clackmannanshire Council will be further consulted by Fife Council on the amended proposals noting that none of the amendments in the updated application affect the Proposed Development within Clackmannanshire.
- 1.5.3 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (Ref 1.7) are the relevant EIA Regulations with regard to applications under the Town and Country Planning (Scotland) Act 1997 (Ref 1.1) and are referred to as the “TCP EIA Regulations” in this EIAR. These set out two schedules, ‘Schedule 1 Development’ for which EIA is a mandatory requirement and ‘Schedule 2 Development’ for which EIA may be required if certain thresholds are met and the development is likely to have significant effects on the environment. KINN is not development of a type identified in Schedule 1 of the EIA Regulations and therefore EIA is not a mandatory requirement.
- 1.5.4 In relation to Schedule 2, KINN does not fall under the descriptions of development in ‘Category 3 Energy Industry’ but could broadly be interpreted as an industrial estate development under ‘Category 10 Infrastructure Projects’ with substations having some similar characteristics to industrial estate developments. In such instances the requirement for EIA can be determined through submission of a screening opinion request to the relevant authorities, however, SPEN considered it appropriate to undertake a proportionate level of environmental assessment having regard to SP Transmission’s statutory duties as a transmission licence holder under the Electricity Act 1989 (Ref 1.2) and the guidance contained in Circular 1/2017 Environmental Impact Assessment Regulations (Ref 1.8). As such the EIA has been undertaken on a voluntary basis.
- 1.5.5 To inform the scope of this EIAR, Scoping Opinion requests were made to Fife and Clackmannanshire Councils in May 2024 with the feedback provided by the Fife and Clackmannanshire Councils and other consultees informing the scope of the EIA reported within this EIAR. In addition, feedback received from pre-application advice from the Councils has also been considered in the EIAR where relevant.

Overhead Line Works

- 1.5.6 The relevant Environmental Impact Assessment (EIA) regulations for applications made under the Electricity Act 1989 (Ref 1.2) are the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (Ref 1.9) (hereafter referred to as the ‘EW EIA Regulations’). These set out two schedules, ‘Schedule 1 Development’ for which EIA is a mandatory requirement

and 'Schedule 2 Development' for which EIA may be required if certain thresholds are met and the development is likely to have significant effects on the environment. None of the Overhead Line Works comprises 'Schedule 1 Development' as they do not involve the construction of or any change to overhead electrical power lines with a voltage of 220kV or more and a length of more than 15km meaning that EIA is not a mandatory requirement.

- 1.5.7 The proposed XL Route Upgrade is 'Schedule 2 Development' as it involves the carrying out of development and a change to an electric line installed above ground with a voltage of 132kV or more meaning that EIA could be required having regard to Schedule 3 of the Regulations.
- 1.5.8 The proposed ZCN and ZCS Route Upgrades are 'Schedule 2 Development' as they involve the carrying out of development and a change to an electric line installed above ground with a voltage of 132kV or more meaning that EIA could be required having regard to Schedule 3 of the Regulations. As noted above, the existing ZCN and ZCS overhead line routes have consent to operate at 400kV therefore the physical works are limited to removal of existing towers and construction of new terminal towers to connect the overhead line routes to the proposed Kincardine North Substation.
- 1.5.9 While the majority of the Overhead Line Works does not involve significant physical works to be undertaken, the Applicant considered it appropriate to undertake a proportionate level of environmental assessment having regard to its statutory duties as a transmission licence holder as well as the requirements of the EIA Regulations. This EIAR sets out the results of the EIA of the Overhead Line Works and accompanies three applications seeking consent under Section 37 of the Electricity Act 1989 (Ref 1.2) and deemed planning permissions under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 (Ref 1.1) for:
- The proposed XL Route Upgrade comprising the increase in operating voltage to 400kV (referred to as 'uprating'), the potential reconductoring approximately 2,860m of the route between towers XL12 to XL20 and works to connect to KINN which include the construction of four new towers and removal of one existing tower.
 - The proposed ZCN Route Upgrade comprising the works to connect to KINN which include the construction of four new towers and removal of one existing tower.
 - The proposed ZCS Route Upgrade comprising the works to connect to KINN which include the construction of four new towers and removal of one existing tower.
 - Temporary masts are proposed for all three routes to support the existing 275kV overhead line circuits during construction.

Scottish Power Distribution Works

- 1.5.10 The Scottish Power Distribution Works comprise removal of spans of existing 11kV wood pole overhead line and installation of underground cables between south of Canal Burn and Hawkhill Farm, and between Tulliallan Poultry Farm and Broomknowe on the A977. Pole 23 would be retained temporarily for the construction period, after which the section of 11kV underground cable extension to the contractor's compound would be permanently removed. Minor reconfiguration works would then take place at pole 23 to maintain the remainder of this underground cable connection. The Scottish Power Distribution Works require planning

permission from Fife Council under the Town and Country Planning (Scotland) Act 1997 (Ref 1.1). The Scottish Power Distribution Works is not development of a type identified in Schedule 1 or Schedule 2 of the TCP EIA Regulations, however, given the requirement for them is in response to KINN, SP Energy Networks considered it appropriate to undertake a proportionate level of environmental assessment having regard to SP Distribution's statutory duties as a distribution licence holder under the Electricity Act 1989 (Ref 1.2), the requirements of the TCP EIA Regulations and the guidance contained in Circular 1/2017 Environmental Impact Assessment Regulations (Ref 1.8).

1.6 Structure of the EIA Report

EIA Report Structure

1.6.1 The EIA Report is published in four volumes

- **Volume 1. Non-Technical Summary (NTS):** this contains a non-technical summary describing the Proposed Development as well as the findings of the EIA process.
- **Volume 2. Main Report:** this comprises the following chapters:
 - **Ch01. Introduction:** provides a brief overview of the Proposed Development including its EIA and consenting requirements as well as an outline of the structure and content of the EIA Report;
 - **Ch02. Approach to EIA:** describes the general approach to the EIA process and how the requirements of the TCP EIA Regulations and EW EIA Regulations have been addressed. It also sets out how feedback from Scoping Opinions and other pre-application consultation has been addressed.
 - **Ch03. Site Selection and Alternatives:** describes the approach to and consideration of alternatives in line with the Applicant's statutory duties under the Electricity Act 1989
 - **Ch04. Description of the Proposed Development:** provides a description of the different components of the Proposed Development including details of their design and construction as well as operation and maintenance requirements.
 - **Ch05. Policy Context:** provides an overview of relevant national and local planning policies.
 - **Ch06. Ecology:** describes the results of the assessment of the Proposed Development's likely significant effects on ecology including designated sites, habitats and protected species.
 - **Ch07. Landscape and Visual Amenity:** describes the results of the assessment of the Proposed Development's likely significant effects on landscape and visual amenity.
 - **Ch08. Cultural Heritage and Archaeology:** describes the results of the assessment of the Proposed Development's likely significant effects on cultural heritage and archaeology.

- **Ch09 Water Environment:** describes the results of the assessment of the Proposed Development's likely significant effects on the water environment.
 - **Ch10. Ground Conditions:** describes the results of the assessment of the Proposed Development's likely significant effects on ground conditions.
 - **Ch11. Traffic & Transport:** describes the results of the assessment of the likely significant effects resulting from the construction of the Proposed Development on traffic and transport.
 - **Ch12. Construction and Operational Noise:** describes the results of the assessment of likely significant effects from noise resulting from the construction and operation of the Proposed Development.
 - **Ch13. Other Environmental Aspects:** provides an overview of other environmental aspects which were scoped out of the EIA at scoping stage.
 - **Ch 14. Schedule of Mitigation:** summarises the measures proposed as part of the design, construction and operation of the Proposed Development to prevent, avoid, reduce or offset adverse environmental effects.
 - **Ch15. Summary and Conclusions:** provides an overall summary of the results of the EIA and identifies whether effects are likely to be significant or not. It also considers the likely significant combined effects resulting from the Proposed Development and the SHE Transmission Works.
- **Volume 3. Figures:** this contains figures and plans of the Proposed Development as referenced in the specialist assessment chapters in Volume 2.
 - **Volume 4. Technical Appendices:** this contains supporting technical information to the specialist assessment chapters contained within Volume 2 as well as copies of the Scoping Opinions provided by the Scottish Ministers and Fife and Clackmannanshire Councils.

Availability of the EIA Report

Representations

- 1.6.2 This EIAR and all supporting documentation for the TCPA applications will be available on the Fife Council website <https://planning.fife.gov.uk/online/> with the section 37 application (Overhead Line Works) on the Scottish Government Energy Consent Unit website at: <https://www.energyconsents.scot/Default.aspx>
- 1.6.3 Hard copies of the EIAR are available for viewing at:
- Kincardine Library 2 Keith St, Kincardine, Alloa FK10 4ND; and
 - Clackmannan Town Hall, Main Street, Clackmannan FK10 4JA
- 1.6.4 Representations regarding the TCPA applications can be made using the online planning system at <https://planning.fife.gov.uk/online/>. Representations regarding the s37 application (Overhead Line Works) can be made via the Scottish Government Energy Consent Unit website at www.energyconsents.scot using the relevant Project Name and/or ECU reference number.

Copies of the EIA Report

- 1.6.5 Hard copies of the EIAR may be requested from the Applicant for a cost of £500 and £10 for a USB storage device copy by contacting eiarequest@spenergynetworks.co.uk

Other Reports Accompanying the Applications

- 1.6.6 In addition to the to the EIAR, the applications are accompanied by the other supporting reports including:
- Pre-Application Consultation (PAC) Reports – reports setting out the pre-application consultation that has taken place prior to the submission of the applications for the Proposed Development.
 - Design and Access Statement (DAS) for KINN
 - Planning Statement for KINN
 - Surface Water Management Strategy for KINN
 - Other technical reports including:
 - Mining Stability Report Including Past Mining Risk Assessment 167521/GL/J/R1, (JWHROSS) (October 2025)
 - Phase 2 Geo-environmental and Geotechnical Site Investigation – Interpretive Report (RSK GeoSciences) (December 2025)
 - Mine Gas Assessment (JWHROSS) (December 2025)
 - Electric and Magnetic Field Report (National Grid) (February 2025)
 - Kincardine North Substation Flood Risk Assessment (AECOM) (November 2025)
 - Electric and Magnetic Field Report (National Grid) (February 2025)

1.7 References

Ref 1.1 Town and Country Planning (Scotland) 1997 (1997) Scottish Government
<https://www.legislation.gov.uk/ukpga/1997/8/contents>

Ref 1.2 Electricity Act 1989 (1989) Section 37 HM Government
<https://www.legislation.gov.uk/ukpga/1989/29/contents>

Ref 1.3 Climate Change Act 2008 (2008) HM Government
<https://www.legislation.gov.uk/ukpga/2008/27/contents>

Ref 1.4 Climate Change (Scotland) Act 2009 (2009) Scottish Government
<https://www.legislation.gov.uk/asp/2009/12/contents>

Ref 1.5 Network Options Assessment (January 2022), National Grid Electricity System Operator & Network Options Assessment Refresh (July 2023), National Grid Electricity System Operator <https://www.neso.energy/document/285321/download>

Ref 1.6 NESO (2022) Pathway to 2030 Holistic Network Design
<https://www.neso.energy/document/262676/download>

Ref 1.7 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (2017) Scottish Government

<https://www.legislation.gov.uk/ssi/2017/102/contents>

Ref 1.8 Planning Circular 1/2017: Environmental Impact Assessment regulations

(2017) Scottish Government, <https://www.gov.scot/publications/planning-circular-1-2017-environmental-impact-assessment-regulations-2017/>

Ref 1.9 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (2017) Scottish Government, <https://www.legislation.gov.uk/ssi/2017/101/contents>

2 Approach to EIA

2.1 Introduction

- 2.1.1 This chapter describes the general approach to and scope of the Environmental Impact Assessment (EIA) of the Proposed Development. It provides general information about the EIA process including the key steps taken in the approach to EIA to identify baseline conditions and identify and assess the likely significant effects as well as describe the terminology used. For a detailed description of topic specific assessment methods reference should be made to the relevant chapter and/or Appendix, for example for a description of the approach to landscape and visual assessment of the Proposed Development, see Chapter 7. Landscape and Visual Amenity and Appendix 7.1.

2.2 About Environmental Impact Assessment

- 2.2.1 EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development. Through the early identification and evaluation of the likely significant environmental effects of a proposed development, EIA enables appropriate mitigation to be identified and incorporated into the proposed development's design to mitigate its permanent or operational effects, or commitments to be made to environmentally sensitive construction methods and practices. Where appropriate it also enables the identification of monitoring during construction and/or operation to ensure that corrective actions can be taken to ensure the effectiveness of mitigation.
- 2.2.2 The EIA of the Proposed Development has been undertaken in parallel with the design process thereby allowing opportunities to mitigate likely significant effects as they have been identified. This approach ensures mitigation is embedded in the design of the Proposed Development and forms an integral component of it.
- 2.2.3 The results of the EIA also ensure that decision-makers, in this case the Scottish Ministers, Fife and Clackmannanshire Councils, statutory consultees as well as other interested parties are aware of a proposed development's potential environmental effects and whether these are likely to be significant or not. The results of the EIA should be taken into account by the decision-makers as part of the determination of the applications.

2.3 Legislative Requirements

Need for EIA

Town and Country Planning Applications

- 2.3.1 The relevant EIA legislation with regard to applications for planning permission under the Town and Country Planning (Scotland) Act 1997 (Ref 1.1) are the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the TCP EIA Regulations) (Ref 1.7). The EIA Regulations include two schedules of development; Schedule 1 lists development for which EIA is mandatory and Schedule 2 lists development for which EIA may

be required if certain thresholds are met and it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

2.3.2 None of the components falling under the TCP EIA Regulations are development of a type identified in Schedule 1 of the EIA Regulations and therefore EIA is not a mandatory requirement. In relation to Schedule 2, these components do not fall under the descriptions of development in 'Category 3 Energy Industry' but KINN could broadly be interpreted as an industrial estate development under 'Category 10 Infrastructure Projects' with substations having some similar characteristics to industrial estate developments. In such instances the requirement for EIA can be determined through submission of a screening opinion request to the relevant local planning authorities. Circular 1/2017 Environmental Impact Assessment Regulations (Ref 1.8) advises that "*the basic test of the need for EIA in a particular case is the likelihood of significant effects on the environment.*" Therefore, development outside the criteria set out in Schedule 1 or 2 does not preclude significant effects arising, particularly where the development is in an environmentally sensitive location.

2.3.3 The Scottish Power Distribution Works is not development of a type identified in Schedule 1 or Schedule 2 of the TCP EIA Regulations (Ref 1.7). Considering both SP Transmission's statutory duties as a transmission licence holder and SP Distribution's statutory duties as a distribution licence holder under the Electricity Act 1989 (Ref 1.2) and the guidance contained in Circular 1/2017 (Ref 1.8), SPEN considered it appropriate to undertake a proportionate level of environmental assessment for these components and have therefore considered the Scottish Power Distribution Works within this EIA on a voluntary basis.

S37 Applications

2.3.4 The relevant EIA legislation with regard to the application for consent under section 37 of the Electricity Act 1989 (Ref 1.2) are the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EW EIA Regulations) (Ref 1.9). The EW EIA Regulations include two schedules of development; Schedule 1 lists development for which EIA is mandatory and Schedule 2 lists development for which EIA may be required if certain thresholds are met and it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

2.3.5 None of the Overhead Line Works comprises 'Schedule 1 Development' as it does not involve the construction of or any change to overhead electrical power lines with a voltage of 220kV or more and a length of more than 15km meaning that EIA is not mandatory.

2.3.6 The Proposed XL Route Upgrade is 'Schedule 2 Development' as it involves the carrying out of development and a change to an electric line installed above ground with a voltage of 132kV or more meaning that EIA could be required having regard to Schedule 3 of the Regulations.

2.3.7 The Proposed ZCN and ZCS Route Upgrades are Schedule 2 Development as they involve the carrying out of development and a change to an electric line installed above ground with a voltage of 132kV or more meaning that EIA could be required having regard to Schedule 3 of the Regulations. As noted above, the existing ZCN and ZCS overhead line routes have consent

to operate at 400kV therefore the physical works are limited to construction of terminal towers to connect the overhead line routes to the proposed Kincardine North Substation.

- 2.3.8 Considering SP Transmission’s statutory duties as a transmission licence holder under the Electricity Act 1989 (Ref 1.2), the Applicant considered it appropriate to undertake a proportionate level of environmental assessment and have therefore undertaken this EIA on a voluntary basis.

Content of an EIA Report

- 2.3.9 Regulation 5 and Schedule 4 of both the TCP EIA Regulations (Ref 1.7) and the Electricity Works EIA Regulations (Ref 1.9) set out the information which an EIA Report must include. Table 2-1, below provides an overview of the requirements and where they are addressed within this EIAR.

Table 2-1 EIA Regulations – Schedule 4 and Regulation 5 Requirements

Legislative Requirement	Where it is contained within the EIAR
Schedule 4 Requirements (as referenced by Regulation 5)	
1. A description of the development, including in particular: (a) a description of the location of the development; (b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases; (c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.	A description of the Proposed Development is contained in chapter 4 of the EIAR .
2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	A description of the alternatives considered as well as the reasons for selecting the Proposed Development with reference to environmental, technical and economic factors is set out in chapter 3 of the EIAR .
3. A description of the relevant aspects of the current state of the environment (the “baseline scenario”) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of relevant information and scientific knowledge.	A description of the current baseline as well as the ‘future baseline’ in the absence of the Proposed Development is contained in chapters 6-13 of the EIAR .

Legislative Requirement	Where it is contained within the EIAR
4. A description of the factors specified in regulation 4(3) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	The results of baseline studies and the environmental factors likely to be significantly affected by the Proposed Development (referred to as receptors) have been identified and are reported in chapters 6-13 of the EIAR.
5. A description of the likely significant effects of the development on the environment resulting from, inter alia: (a) the construction and existence of the development, including, where relevant, demolition works; (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); (e) the cumulation of effects with other existing and / or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; (g) the technologies and the substances used. The description of the likely significant effects on the factors specified in regulation 4(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union level (as they had effect immediately before IP completion day) or United Kingdom level which are relevant to the project including in particular those established under the law of the United Kingdom that implemented Council Directive 92/43/EEC and Directive 2009/147/EC.	The likely significant effects resulting from the Proposed Development are assessed and reported in chapters 6-13 of the EIAR.
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered	Relevant assessment methods as well as any assumptions or

Legislative Requirement	Where it is contained within the EIAR
compiling the required information and the main uncertainties involved.	limitations are set out in in chapters 6 -13 of the EIAR.
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	Embedded mitigation measures and additional mitigation measures are identified in chapters 6-13 of the EIAR. The mitigation measures are also summarised in chapter 14.
8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to assimilated law such as any law that implemented Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments may be used for this purpose provided that the requirements of any law that implemented the Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	The Proposed Development is not expected to result in significant adverse effects as a result of its vulnerability to major accidents or disasters. Further information is provided in chapter 13 of the EIAR.
9. A non-technical summary of the information provided under paragraphs 1 to 8.	A separate non-technical summary (NTS) that sets out the key findings of the EIA is available as Volume 1 of this EIAR.
10. A reference list detailing the sources used for the descriptions and assessments included in the EIA report.	Where relevant, references are provided as footnotes throughout the EIAR.

Regulation 5 requirements

(3) Where a scoping opinion (or scoping direction) is issued, the EIA report must be based on that scoping opinion (or scoping direction, as the case may be), and include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the development on the environment, taking into account current knowledge and methods of assessment.	Provided throughout the EIAR.
5) In order to ensure the completeness and quality of the EIA report— (a) the developer must ensure that the EIA report is prepared by competent experts; and	A statement of competence can be found in Appendix 1-1 of the EIAR

Legislative Requirement	Where it is contained within the EIAR
(b)the EIA report must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.	

2.4 Scope of the EIA

Kincardine North Substation

- 2.4.1 Scoping opinions were requested from Fife and Clackmannanshire Councils in May 2024. In reaching their opinions the Fife and Clackmannanshire Councils are required to consult with the relevant consultees. The scoping opinion request set out the proposed scope of the EIA, in particular those aspects of the environment in which likely significant environmental effects would potentially occur and which were therefore proposed to be scoped into the EIA and those aspects of the environment in which significant environmental effects were considered unlikely and therefore proposed to be scoped out of the EIA.
- 2.4.2 The scoping opinions provided by the Fife and Clackmannanshire Councils as well as advice provided by those bodies with whom they consulted are summarised below in Table 2-2. This also sets out where the points raised have been addressed within the EIAR or, where relevant, in other reports accompanying the applications (see bold underlined text). Copies of the Scoping Opinions are provided in Volume 3. Technical Appendices, Appendix 2.1.

Overhead Line Works (XL/ZCN/ZCS Uprating and Turn-Ins)

- 2.4.3 A scoping opinion was requested from Scottish Ministers in May 2024. In reaching its opinion Scottish Ministers are required to consult with the relevant consultees. The scoping opinion request set out the proposed scope of the EIA, in particular those aspects of the environment in which likely significant environmental effects would potentially occur and which were therefore proposed to be scoped into the EIA and those aspects of the environment in which significant environmental effects were considered unlikely and therefore proposed to be scoped out of the EIA. A Scoping Opinion was received in August 2024 and contains comments from the Scottish Ministers and consultees on the scope of the assessment.
- 2.4.4 The scoping opinion provided by the Scottish Ministers and consultees as well as advice provided by those bodies with whom they consulted are summarised below in Table 2-2. This also sets out where the points raised have been addressed within the EIAR or, where relevant, in other reports accompanying the section 37 application. Copies of the Scoping Opinion are provided in Volume 3. Technical Appendices, Appendix 2.1.

Table 2-2 Summary of Scoping Opinions

Component	Consultee	Summary of Response and how it has been addressed
Kincardine North Substation	Fife Council	Set out the aspects which should be scoped into the EIA and those which could be scoped out. Fife Council also provided comments with regard to a range of topic specific matters including: • Providing advice in relation to requirements regarding the assessment of alternatives. <u>Alternatives are addressed in chapter 3 of this EIAR.</u> • Requiring the EIAR to include a summary of all mitigation measures proposed. <u>Chapter 14 of this EIAR includes a summary of mitigation commitments.</u> • Advising that while certain matters could be scoped out of the EIA information should be provided on these. <u>This is included in chapters 6-13 of this EIAR.</u> • Land and Air Quality Services noting that ground investigations are to be undertaken and requesting that contaminated land risk assessment be provided. <u>This is included in the Coal Mining Risk Assessment and Ground Investigation Reports which accompanies the applications.</u> • Archaeology advisor noted that the EIAR should include consideration of the potential for buried archaeology to be present, a strategy to test for the presence or not of buried archaeology, a strategy to mitigate the impact of development on physical deposits that may exist on site and consideration of the visual impact on the surrounding historic environment. <u>These matters are addressed in chapter 8 of the EIAR.</u> • Built Heritage advisor requested that consideration be given to the impact of the Proposed Development on the setting of non-designated heritage assets including Kilbagie House and Mill, industrial archaeology around the former Kilbagie Mills site and historic farmsteads and buildings to the west at Broadcarse and Craighton. <u>This is addressed in chapter 8 of the EIAR.</u> • Natural Heritage advisor confirmed that the proposed scope was appropriate but requested that consideration be given to impacts on the existing SUDS pond. They also advised that scrub removal will necessitate some compensatory planting measures, and that landscaping should consider the use of native species. <u>These are addressed in chapters 6, 7 & 9 of the EIAR.</u> • Transport advised that consideration be given to transport-related matters during construction (and decommissioning periods) and agreed that once operational the Proposed Development would not generate significant traffic. <u>An assessment of construction traffic is contained in chapter 11 of the EIAR.</u> The effects of decommissioning on transport-related matters have not been assessed, as it is not proposed that the substation would be decommissioned. The lifespan of the equipment within the proposed substation is approximately 40 years, however, it is expected that this would be extended through replacement or refurbishment. In the event that

Component	Consultee	Summary of Response and how it has been addressed
		the Proposed Development was no longer required and could be decommissioned then a Decommissioning Plan would be prepared and planning permission would be obtained, if required, in accordance with the relevant legislation in place at the time
	Clackmannanshire Council	Provided advice on those aspects which should be considered within the EIAR including: - The locational requirement for the proposed site and the need to set out alternatives considered. <u>This is addressed in chapter 3 of the EIAR.</u> - The potential landscape and visual impact given the flat and open nature of the landscape, in particular noting the potential impact in views from the west including those on a tourism facility recently developed at Broadcarse Farm. <u>This is considered in chapter 7 of the EIAR.</u> - Consideration of the impact of users of key transport routes including A876 and National Cycle Route 76. <u>This is considered in chapter 11 the EIAR.</u> - The approach to landscape mitigation in particular the use of native screen planting to reduce impacts in views from the west. <u>This is considered in chapter 7 of the EIAR.</u> The impact on the historic relationship between Kilbagie and Kennetpans. <u>This is considered in chapters 6-12 of this EIAR.</u>
	NatureScot (NS)	Nature Scot noted that there are no protected areas present at the proposed substation site and offered no further comment.
	Historic Environment Scotland (HES)	HES noted that there are no designated sites within the Proposed Development but there are a small number in the wider area including Tulliallan Castle scheduled monument, Kennetpans Distillery scheduled monument and Tulliallan Garden and Designed Landscape. HES noted the potential to impact the setting of these sites. <u>This is addressed in chapter 8 of the EIAR.</u>
	Scottish Environment Protection Agency (SEPA)	SEPA provided advice with respect to design and proximity to water environment features, flood risk, peatland/carbon rich soils, ground water and pollution prevention. Details of how the design has considered water environment features are set out in Chapter 4. <u>Flood risk is considered in a separate Flood Risk Assessment which accompanies the applications.</u> There are no peatland or carbon rich soils present so this has been scoped out. <u>Details of pollution prevention measures are set out in chapters 9 and 14 of this EIAR.</u> Provided guidance in relation to level of detail required in site layout plans. <u>A description of the Proposed Development and accompanying plans is contained in chapter 4 of this EIAR.</u>

Component	Consultee	Summary of Response and how it has been addressed
		- Engineering activities affecting the water environment. As far as possible the design of the Proposed Development seeks to avoid engineering activities in the water environment and adhere to 50m buffers to reduce potential impacts. Further details are provided in chapter 9 of this EIAR. - Disturbance and re-use of excavated peat and other carbon rich soils. No carbon rich soils or peat are present on the site therefore this is not considered in this EIAR. - Disruption to Groundwater Dependent Terrestrial Ecosystems (GWDTEs) and groundwater abstractions. No GWDTEs or groundwater abstractions have been identified therefore this is not considered in this EIAR. - Pollution prevention and environmental management. Details of pollution prevention and environmental management measures are contained in chapters 9 and 13 of this EIAR.
	Scottish Water	Confirmed that there are no Scottish Water drinking water catchments or abstractions which are designated as Drinking Water Protected Areas that may be affected. Advised that they would not allow surface water connections into the combined sewer system to prevent potential sewer flooding. No surface water connections into the combined sewer system are proposed as part of the Proposed Development.
	Transport Scotland	Provided advice with respect to the use of the A876 and specific requirements with regard to access and movement of abnormal loads. This is considered in chapters 11 of this EIAR.
Overhead Line Works	Scottish Ministers	- Scottish Ministers are broadly content with the EIA set out at Chapter 3 of the Scoping Report. This table includes details as to how and where matters raised in the Scoping Opinion have been addressed in the EIAR. - Scottish Ministers Request that the applicant include a section in the EIA Report on the justification of Route Selection. Alternatives are addressed in chapter 3 of this EIAR. - Scottish Ministers note the detailed comments provided by Historic Environment Scotland, Network Rail, Transport Scotland and Defence Infrastructure Organisation regarding requirements for information to be included in the EIA Report and agree with all their requests. This is considered in chapters 8 and 11 of this EIAR. - Scottish Ministers request that the company contacts Scottish Water (via EIA@scottishwater.co.uk) and makes further enquires to confirm whether there are any Scottish Water assets which may be affected by the development. The Applicant has undertaken a utility search which confirms that there are no Scottish Water assets present at the site. - Scottish Ministers request that the Company investigates the presence of any private water supplies which may be impacted by the development. The EIA report should include details of any supplies identified by this investigation,

Component	Consultee	Summary of Response and how it has been addressed
		and if any supplies are identified, the Company should provide an assessment of the potential impacts, risks, and any mitigation which would be provided. <u>No private water supplies are present within the vicinity of the Overhead Line Works where new construction works are required.</u> • In addition to identifying the main watercourses and waterbodies within and downstream of the proposed development area, developers should identify and consider, at this early stage, any areas of Special Areas of Conservation where fish are a qualifying feature and proposed felling operations particularly in acid sensitive areas. <u>There are no Special Conservation Areas (SACs), including SACs for which fish are a qualifying feature, within the vicinity of the Overhead Line Works.</u> • MD-SEDD also provide standing advice for overhead line development (which has been appended at Annex A) which outlines what information, relating to freshwater and diadromous fish and fisheries, is expected in the EIA report. Use of the checklist provided, should ensure that the EIA report contains the required information; the absence of such information may necessitate requesting additional information which may delay the process. Developers are required to submit the completed checklist in advance of their application submission. <u>A completed copy of the checklist was appended to the Gate Check Report for the Overhead Line Works.</u> • Scottish Ministers consider that where there is a demonstrable requirement for peat landslide hazard and risk assessment (PLHRA), the assessment should be undertaken as part of the EIA process to provide Ministers with a clear understanding of whether the risks are acceptable and capable of being controlled by mitigation measures. The Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition), published at http://www.gov.scot/Publications/2017/04/8868, should be followed in the preparation of the EIA report, which should contain such an assessment and details of mitigation measures. <u>There is no peat present where new overhead line infrastructure (i.e. terminal towers) is proposed. There is not considered to be a risk of peat landslide due to the limited intrusive nature of the upgrade works. Further information is provided in chapter 10 of this EIAR.</u> • Scottish Ministers advise that Viewpoints should be prepared to inform and support the Landscape and Visual Impact Assessment ('LVIA') and must be agreed in advance of preparation with Clackmannanshire Council, Fife Council and NatureScot. <u>Viewpoint locations have been identified in consultation with the Local Planning Authorities. Further information on landscape and visual impacts can be found in chapter 7 of this EIAR.</u> • Ministers expect Company's to conduct adequate pre-application consultation and to demonstrate what alternatives to the proposal were considered before arriving at the design they apply for. Ministers agree with the Planning Authority that the EIA should include a description of the main development alternatives which are relevant to the proposal and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. <u>Details of the pre-application consultation</u>

Component	Consultee	Summary of Response and how it has been addressed
		<u>undertaken are set out within the Pre-Application Consultation Report which accompanies the applications and consideration of alternatives is set out within Chapter 3: Site Selection and Alternatives.</u> - The mitigation measures suggested for any significant environmental impacts identified should be presented as a conclusion to each chapter. Applicants are also asked to provide a consolidated schedule of all mitigation measures proposed in the environmental assessment, provided in tabular form, where that mitigation is relied upon in relation to reported conclusions of likelihood or significance of impacts. <u>Mitigation measures are included where relevant in Chapters 6-13 of this EIAR. A consolidated Mitigation Register is provided in Chapter 14: Schedule of Mitigation.</u> - When finalising the EIA report, applicants are asked to provide a summary in tabular form of where within the EIA report each of the specific matters raised in this scoping opinion has been addressed. <u>This table within this EIAR includes details as to how and where matters raised in the Scoping Opinion have been addressed in the EIAR.</u>
	BT	The Project should not cause interference to BT's existing and planned radio network. <u>Noted and therefore not addressed within the EIAR.</u>
	Clackmannanshire Council	Raised no issue with regard the proposed scope of the EIAR in relation to the matters to be scoped in/out but made a number of observations.: - Consideration of cumulative impacts. <u>Cumulative impacts are addressed within chapters 6-12 of this EIAR</u> - Seek to enhance biodiversity value. <u>Details of biodiversity enhancement proposals are set out within chapter 6 of this EIAR.</u> - Consideration of landscape and visual impacts. <u>Landscape and visual impacts are addressed within chapter 7 of this EIAR.</u> - Consideration of the Canal Burn. <u>The Canal Burn is addressed within chapter 9 of this EIAR.</u> - Consideration of mitigation to reduce impacts on tourism and recreational interests. <u>Mitigation is addressed within chapters 6-13 of this EIAR.</u>
	Defence Infrastructure Organisation (DIO)	Noted that the development falls within a Low Flying Area and the potential for new overhead line towers to introduce a physical obstacle to low flying aircraft. The DIO requested that any consent awarded be subject to a condition requiring details of tower locations and heights be provided to prevent potential conflicts with low flying aircraft. <u>The DIOs requirements are noted. It is considered that this does not require to be addressed within this EIAR as the Applicant is content to accept such a condition.</u>

Component	Consultee	Summary of Response and how it has been addressed
	Historic Environment Scotland (HES)	Identified the potential impacts on historic environment interests and advised on potential receptors to be considered comprising Tulliallan Castle scheduled monument and Tulliallan Garden and Designed Landscape. <u>Effects on designated historic environment interests including those assets identified by HES are assessed within chapter 8 of this EIAR.</u>
	Joint Radio Company	Advised that the proposal is cleared with respect to radio link infrastructure operated by the local energy networks. <u>The consultee confirmed that the proposed upgrades should not cause any interference therefore it is not addressed in this EIAR.</u>
	Kincardine Community Council	Raised a number of comments including: 1. With regard to why the proposed Kincardine North Substation was not included in scoping. <u>The proposed Kincardine North Substation was the subject of a separate scoping opinion request to Fife and Clackmannanshire Councils as they are the relevant decision maker regarding applications under the Town and Country Planning (Scotland) Act 1997</u> 2. Raised concerns with regard to deemed planning permission and the community council's role as a consultee. <u>It is expected that Kincardine Community Council would be consulted on the applications for consent under section 37 of the Electricity Act 1989.</u> 3. Raised concern in relation to works for the proposed upgrade and Kincardine North Substation being undertaken in parallel and discharge of conditions attached to the relevant consents. <u>The scoping opinion request makes clear that works being undertaken in parallel is subject to consents being granted which would include the discharge of relevant conditions attached to planning permission for the proposed Kincardine North Substation or section 37 consents for the proposed upgrades.</u> The project programme would seek to advance the substation and overhead line works in parallel but it is acknowledged that this will be reliant on the timely discharge of the relevant consent conditions. 4. Queried the likely significant effects which could occur in relation to ecology. <u>This relates to potential habitat loss and disturbance of protected species being more likely to occur where significant construction works are required at Kilbagie as opposed to wider overhead line routes where construction works are more limited. This is addressed within chapter 6 of this EIAR.</u> 5. Raised concerns with regard to landscape and visual effects. <u>Landscape and visual effects resulting from the construction of the new overhead line towers at Kilbagie are addressed within chapter 7 of this EIAR.</u>

Component	Consultee	Summary of Response and how it has been addressed
		6. Raised concerns with regard to the acceptability of potential impacts on Tulliallan Castle. <u>Potential impacts on Tulliallan Castle scheduled monument are addressed within chapter 8 of this EIAR.</u> 7. Raised concerns with regard to potential spillages, leaks or suspended sediment in runoff. <u>Mitigation measures to prevent pollution impacts are set out within chapters 9 and 14 of this EIAR.</u> 8. Raised concerns with regard to historic mining activity. <u>Ground investigations have been undertaken to inform the design of the proposed upgrade works as well as the proposed Kincardine North Substation. A Coal Mining Risk Assessment, Mining Stability Report and Phase 2 Geo-environmental and Geotechnical Site Investigation Report have been submitted with the applications.</u> 9. Raised concerns with regard to the impact on land use and the land owner. <u>The Applicant acquired the site from the landowner on a voluntary basis. While there will be a loss of agricultural land, the land in question is classed as grade 3.1/3.2 in the National scale land capability for agriculture map. Therefore no likely significant effects on land use are anticipated and land use has been scoped out of the EIAR.</u> 10. Raised concerns with regard to noise impacts. <u>Potential impacts as a result of noise are addressed within chapter 12 of this EIAR.</u> 11. Raised concerns with regard to construction traffic. <u>Details of construction traffic associated with the proposed upgrades are set out within chapter 11 of this EIAR. A Construction Traffic Management Plan will be prepared post-consent/pre-construction.</u> 12. Raised concerns with regard to impacts on air quality from dust during construction. <u>Mitigation measures to prevent dust impacts are included within chapter 14: Schedule of Mitigation.</u> (Note 13-21 of the response are duplicate entries of 4-12) 1. Raised concerns regarding electric and magnetic fields. <u>Details of electric and magnetic fields along with details of the relevant guidelines are set out within Section 4.9 Design Compliance with UK Code of Practice on EMF.</u> 2. Raised concerns regarding flooding. <u>The proposed overhead line towers at Kilbagie are outside of flood zones identified on SEPA's Flood Risk maps therefore flooding is not considered to be a significant risk to the proposed upgrades.</u> 3. Raised concerns regarding human health. <u>As above, details of electric and magnetic fields as well as relevant guidelines are set out within Section 4.9 Design Compliance with UK Code of Practice on EMF.</u>

Component	Consultee	Summary of Response and how it has been addressed
	NatureScot	Noted their satisfaction with regard to the proposed scope of and approach to the EIA and raised a query regarding whether or not a Habitat Regulations Assessment (HRA) would be undertaken. <u>The consultee noted their satisfaction regarding the EIA. With regard to HRA, a separate HRA Screening Assessment can be found within Appendix 6.4. This considers the proposed Kincardine North Substation including Hawkhill Road as well as the proposed overhead line towers at Kilbagie and the Scottish Power Distribution Works.</u>
	Network Rail (NR)	Requested that a traffic assessment be undertaken indicating construction traffic routes to enable NR to consider potential impacts on their infrastructure. <u>Chapter 4: Description of the Proposed Development and the Traffic and Transport assessment within Chapter 11 of this EIAR identifies access routes to the proposed overhead line towers at Kilbagie to enable NR to consider potential impacts on their infrastructure.</u>
	Scottish Forestry	Noted that the nature of the proposals meant that impacts on existing trees and woodland were limited and therefore considered it reasonable they be scoped out. <u>The consultee indicated their agreement that impacts on trees and woodland could be scoped out of the EIA and it is therefore not addressed within this EIAR.</u>
	Scottish Water	Advised that they do not hold records of drinking water catchments or water abstractions sources that could be impacted by the proposed upgrades but that there is live infrastructure in proximity to the proposed upgrades. They required the applicant to identify any potential conflicts with their assets and contact Scottish Water's Asset Impact Team. <u>No issues raised for consideration within the EIAR. The Applicant has undertaken a utility search which confirms that there are no Scottish Water assets present at the site.</u>
	ScotWays	Advised that they could not respond. <u>The consultee did not raise any issues to be addressed within the EIAR.</u>
	SEPA	Confirmed that they did not have site specific advice given the scale and nature of the works and advised consideration be given to the relevant standing advice. <u>The Standing Advice has been considered within the Water Environment assessment within chapters 9 and 14 of this EIAR, where appropriate.</u>
	Transport Scotland	Confirmed their agreement that given the nature of the proposed upgrade works significant traffic effects are unlikely, however, they advised a Construction Traffic Management Plan would be required. <u>It is considered that a Construction Traffic Management Plan would usually be the subject of a condition of any consent issued and would therefore be prepared post-consent/pre-construction.</u>
	Marine Directorate	Provided their standing advice and EIA checklist. <u>A completed copy of the checklist was appended to the XL-ZCN-ZCS Upgrades Gate Check Report.</u>

2.4.5 Based on the Scoping Opinions the following aspects were scoped into the EIA:

- Ecology
- Landscape and Visual Amenity
- Cultural Heritage and Archaeology
- Water Environment
- Ground Conditions
- Traffic and Transport
- Construction and Operational Noise
- Cumulative Effects

2.4.6 In their scoping opinions it was noted that Fife Council and Scottish Ministers referred to the aspects which they agreed could be scoped out (trees and woodland, land use, tourism and recreation, major accidents and disasters, air quality, climate change and human health) but requested that information relating to these was also provided. This is included in 'Other Environmental Aspects' (within chapter 7) of this EIAR.

Other Pre-Application Consultation

2.4.7 In addition to the Scoping Opinions for Kincardine North Substation, pre-application advice was provided by Fife Council and Clackmannanshire Council. Points raised in the advice which are relevant to the EIA are summarised below:

- Fife Council's preapplication consultation advice set out planning policy considerations in the context of the Development Plan relevant to a range of matters addressed in the EIA as well as provided advice on the submission and determination of the applications. Specific requirements comprise:
 - Site Selection Appraisal – chapter 3 of this EIAR sets out the consideration of alternatives including alternative sites for the Proposed Development.
 - Landscape and Visual assessment – chapter 7 of this EIAR contains a Landscape and Visual Assessment of the Proposed Development.
 - Noise report – chapter 12 of this EIAR contains an assessment of construction and operational noise of the Proposed Development.
 - Details regarding economic benefits – details of economic benefits associated with the Proposed Development are set out in the Planning Statement.
 - Construction Traffic Management Report – chapter 11 of this EIAR contains an assessment of construction traffic generated by the Proposed Development.
 - Evidence relating to landownership in relation to access design – a plan showing land in the control of the Applicant accompanies the applications.
 - Surface Water Management Plan – a Surface Water Management Strategy accompanies the applications.
 - Flood Risk Assessment – a Flood Risk Assessment accompanies the applications.

- Maintenance and management plan for the proposed surface water management solution – details are contained in the Surface Water Management Strategy.
 - Ecological Appraisal Report – chapter 6 of this EIAR contains an ecological impact assessment of the Proposed Development.
 - A Landscaping Plan – a plan showing proposed hard and soft landscaping design is provided as part of the Landscape and Visual Assessment within chapter 7 of this EIAR.
 - A supporting statement outlining compliance with National Planning Framework 4 (NPF4) policies 1 and 2 (Ref 2.1) – a separate Planning Statement considering compliance with the Development Plan accompanies the applications.
 - Coal Mining Risk Assessment – a separate Coal Mining Risk Assessment accompanies the applications.
- Clackmannanshire Council’s pre-application consultation advice identified a number of points to be addressed in the applications:
 - Details of the locational requirement for the proposed site and consideration of alternative sites including on brownfield land – chapter 3 of this EIAR sets out the consideration of alternatives including alternative sites for the Proposed Development.
 - Advised that consideration should be given to the potential impact holiday accommodation located at Broadcarse Farm – chapter 13 of this EIAR contains an assessment of potential impacts on the holiday accommodation.
 - Advised that measures would be required to mitigate the adverse impacts of the Proposed Development including provision of native screen planting – chapter 7 of this EIAR contains a Landscape and Visual Assessment of the Proposed Development as well as a plan showing proposed hard and soft landscaping design.
 - Advised that the Proposed Development would erode the historic relationship between Kilbagie and Kennetpans. Cultural heritage effects are assessed in chapter 8 of this EIAR.

2.5 Approach to EIA

Key Stages in EIA

2.5.1 The key stages in the EIA are:

- **Scoping studies:** Scoping was the first step in the EIA process. Regulation 17 of the TCP EIA Regulations 2017 (Ref 1.7) and Regulation 12 of the EW EIA Regulations 2017 (Ref 1.9 allows developers to request a scoping opinion as to the content of an EIA Report. As described in the preceding section Scoping Opinions were requested from Fife and Clackmannanshire Councils and Scottish Ministers to ensure that the EIA addressed their and other consultees’ requirements. Subsequent chapters set out comments received in scoping and how they have been addressed in undertaking the EIA.
- **Baseline studies and additional consultation:** For each environmental aspect, these have comprised a combination of desk-based studies and field surveys to establish an understanding of the existing environmental conditions ('the baseline') and future

baseline in the absence of the development, within a specific study area and therefore ensure an accurate assessment of the likely significant effects of the Proposed Development. The scope of baseline studies has been agreed with relevant consultees as part of scoping and, where appropriate, additional consultation.

- **Impact prediction and identification of mitigation:** The potential environmental impacts of the Proposed Development (both beneficial/positive and adverse/negative) have been predicted and evaluated using a range of specialist methods which are described in subsequent chapters. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified, with the aim of preventing or reducing impacts as much as possible. Where feasible, mitigation measures have been incorporated into the design of the Proposed Development, referred to as embedded mitigation, such that they inform its detailed design and / or how it shall be constructed. A preliminary assessment of likely effects has been undertaken to identify their significance and where possible identify additional mitigation measures to be applied which could reduce them.
- **Identification of likely significant effects:** As stated above, the purpose of the EIA is to determine the likely significant effects of the Proposed Development. A detailed description of the general approach to assessing impacts is contained in this chapter, with detailed approaches tailored to individual technical assessments following topic-specific guidance contained in subsequent chapters. As described above a preliminary assessment of the significance of effects is undertaken taking account of mitigation measures embedded in the design and construction of the Proposed Development. Where appropriate, for example, where a likely significant effect may remain, additional mitigation measures may also be identified. In some instances additional mitigation may be applied where effects are not likely to be significant. The EIAR presents the significance of the likely residual effects of the Proposed Development i.e. those which remain, taking into account of embedded and additional mitigation measures and stating whether these are significant or not.

Characterising of the Baseline Environment

- 2.5.2 In order to assess the likely significant effects resulting from the Proposed Development it is necessary to first establish the environmental conditions that currently exist at or close to the Proposed Development (referred to as ‘the baseline’) as well as the likely evolution of the baseline without the Proposed Development (referred to as ‘the future baseline’).
- 2.5.3 An understanding of the baseline environment for each environmental topic has been established through a range of activities including field surveys to make observations and/or record data, desk-based studies including reviews of relevant documentation and literature as well as stakeholder consultation. Subsequent chapters of this EIAR set out the baseline studies which have been undertaken and the sources of information which have been consulted in undertaking the EIA.

Types of Effects

- 2.5.4 The assessment of effects considers a range of different effects including, as appropriate to each environmental topic: adverse and beneficial effects, direct effects and indirect effects,

temporary (or short term) effects, longer term, operation and permanent effects as well as cumulative, effects.

Direct Effects and Indirect Effects

- 2.5.5 Direct effects are those where there is a physical connection between the Proposed Development and the receptor (for example, direct impacts on a sensitive ecological receptor resulting from habitat removal), whereas indirect effects require some additional pathway for the effect to arise (for example, impacts on surface water quality on other watercourses within the catchment from spillage risk).

Temporary Effects

- 2.5.6 Temporary effects mainly occur during the construction phase only and are typically short or medium term. This would include effects resulting from the construction of the Proposed Development such as construction traffic, noise and vibration from construction plant and machinery, dust generation and site runoff, as well as temporary effects resulting from requirements for temporary access tracks or construction compounds.

Longer Term, Operational & Permanent Effects

- 2.5.7 Longer term, operational and permanent effects are those which would occur as a result of the Proposed Development, such as its land take or as a result of its operation. This would include effects which may begin during construction and endure for the lifetime of the Proposed Development, or effects which occur for a period of time following completion of construction or during operation only.

Decommissioning Effects

- 2.5.8 Decommissioning effects would be those which would occur as a result of the removal of the Proposed Development at the end of its operational life. It is generally the case that rather than decommissioning, the substation or overhead line (or parts thereof) would be refurbished or replaced in order to extend their operational lives. Given the nature of the Proposed Development is such that it would form an integral part of the electricity transmission and distribution networks it would be operated and maintained until no longer required and it is therefore not proposed that the Proposed Development would be decommissioned, therefore decommissioning effects have been scoped out of assessment.

Residual Effects

- 2.5.9 Residual effects are those effects that remain having taken account of additional mitigation measures. As noted above, the approach taken to the EIA of the Proposed Development means that much of the mitigation is an inherent part of the design (design measures) and how it will be constructed (construction measures). As a result, the significance of some residual environmental effects may be the same as the significance of the likely environmental effects. It should be noted that this is not because they have not been mitigated, but rather that by incorporating mitigation into the design and construction of the Proposed Development from the outset, effects have been mitigated as far as possible. In subsequent chapters, this means that there may be more substantive reporting of the likely effects as opposed to the likely residual effects.

Cumulative Effects

- 2.5.10 For the purpose of the EIA, cumulative effects have been defined under two categories; intra-project effects and inter-project effects:
- **Intra-Project Effects:** The combined effects arising as a result of the Proposed Development upon a single receptor or resource. An example would be where a local resident is affected by dust, noise and a loss of visual amenity during the construction of the substation, with the result being a greater nuisance than each individual effect alone.
 - **Inter-Project Effects:** The combined effects of the Proposed Development with other relevant developments which may not, on an individual basis result in likely significant effects but, together (i.e. cumulatively), could have a likely significant effect.
- 2.5.11 With regard to inter-project effects, a review of planning applications (or other pre-application enquiries) made to Fife Council, Clackmannanshire Council and the Energy Consents Unit within the past five years has been undertaken to identify other developments with which the Proposed Development could result in cumulative environmental effects.
- 2.5.12 For the majority of environmental aspects, the relatively localised nature of the impacts resulting from the Proposed Development mean that the search area for cumulative developments is relatively small extending up 1km from the Proposed Development, however, for some aspects additional cumulative developments may also be considered as appropriate that aspect (for example landscape and visual effects may be experienced over a greater distance).
- 2.5.13 Within 1km of the Proposed Development the following cumulative developments have been identified that have the potential for cumulative impacts. Note that small domestic developments such as house extensions have not been considered as by their small nature they are unlikely to combine with the Proposed Development to result in significant cumulative effects. Table 2-3 identifies the key cumulative developments which have been considered in the cumulative assessment for all aspects, however, as noted above some aspects may also include consideration of additional cumulative developments.

Table 2-3 Key Cumulative Developments

Development	Description	Status	Location
Kincardine Battery Energy Storage System (BESS) (ECU00004987)	342 megawatt BESS and associated access, drainage and landscaping.	Approved (pending construction)	Located in Fife to the south/southwest of the Proposed Development south of Hawkhill Road
Kincardine Grid Services Complex (ECU00003326)	Grid services facility comprising BESS and synchronous condenser as well as associated access, drainage and landscaping.	Approved (pending construction)	Located in Fife to the immediate west of the Proposed Development adjacent to the A876.
Aggregate Storage Building and	Aggregate storage building unit including welfare, and	Approved (pending construction)	Located in Fife south of Proposed Development

Development	Description	Status	Location
associated hardstanding (24/00979/FULL)	hardstanding areas as well as loading areas.		south of Hawkhill Road at the disused railhead.
Underground Cable from KINN to existing Kincardine Substation (25/02494/SCR)	Installation of 275kV underground cable circuit between KINN and existing Kincardine Substation approximately 1.9km long.	Pre-application (screening)	Located in Fife within the Site and extending south to Hawkhill Road, crossing it into the existing Kincardine Substation.
Temporary installation of transformers at Kincardine Substation (25/02355/SCR)	Temporary installation of two 400kV transformers within the existing Kincardine Substation site.	Permitted Development (pending construction)	Located in Fife within the footprint of the existing Kincardine Substation, approximately 1km south of the KINN substation platform.
Kilbagie Battery Energy Storage System (BESS) (ECU00005240)	Up to 250MW BESS and associated infrastructure.	Application (submitted, decision pending)	Located in Clackmannanshire approximately 50-100m north of the Proposed Development.
Meadowend Battery Energy Storage System (BESS) (ECU00005178)	Up to 500MW BESS and associated infrastructure.	Pre-application (screening)	Located in Clackmannanshire approximately 640m north of the Proposed Development.

Cumulative sites search undertaken February 2026

Transboundary Effects

- 2.5.14 The EIA Regulations also require consideration of transboundary effects; these are effects which occur in one country as a result of proposed development or activity in another country. In relation to the Proposed Development, its scale and location mean that is not considered likely to result in transboundary effects therefore they have not been considered any further.

Identification and Assessment of Likely Significant Effects

- 2.5.15 There is no statutory definition of what constitutes a 'significant' effect within the EIA Regulations, however, the determination of the significance of effects is important to informing the decision-making process. The process typically involves consideration of two aspects of a potential effect, namely the sensitivity and/or value of the receptor or resource being affected, and the magnitude of the impact occurring on the receptor/resource.
- 2.5.16 The significance of the effects including residual effects (i.e. those that are predicted to remain after the mitigation measures have been implemented) can be determined by a range of factors including:
- Scale of impact

- Duration and/or frequency of impact (e.g. temporary or permanent)
- Nature of effect (e.g. direct or indirect, adverse or beneficial)
- Sensitivity of the receptor

2.5.17 The following subsections provide an overview of the general approach to EIA, however for each environmental aspect a topic specific method has been used and is described in later chapters.

Describing the Sensitivity, Value or Importance of receptors

2.5.18 The sensitivity of the baseline conditions is identified according to the relative importance of existing environmental features on or near to the site of the Proposed Development, or by the sensitivity of receptors which could potentially be affected by it. Criteria for the determination of sensitivity or importance or value of receptors are established based on approved guidance, legislation, statutory designation and / or professional judgement.

2.5.19 The criteria in Table 2-4 provide a general definition for determining the sensitivity, value or importance of receptors.

Table 2-4 Sensitivity or Value Criteria

Sensitivity or Value	Description
Very high	The receptor has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low capacity to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value or importance.

Describing the Magnitude of Impacts

2.5.20 The magnitude of potential impacts on environmental baseline conditions is identified through consideration of the Proposed Development, taking into account the scale or degree of change from the existing baseline as a result of the effect. Consideration is given to the duration and reversibility of the impact as well as consideration of relevant legislative or policy standards or guidelines.

2.5.21 General criteria for defining the magnitude of an impact are set out in Table 2-5, below. Key factors influencing this include:

- The physical or geographical scale of the impact, (note that this is relative to the scale of the receptor or resource affected).

- The duration of the impact - will it be short term, lasting for a few days or weeks, or long term, lasting for a number of years.
- The frequency of the impact - will it occur hourly, daily, monthly or will it be permanent, lasting for the duration of the development.
- The reversibility of the impact - can it be reversed following completion of construction or decommissioning of the development.

Table 2-5 Impact Magnitude Criteria

Magnitude	Description
High	Adverse: Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features, or elements. Beneficial: Large scale or major improvement of resource, including extensive restoration or major improvement of attribute quality.
Medium	Adverse: Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Beneficial: Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse: Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial: Minor benefit to, or in addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk or negative impact occurring.
Negligible	Adverse: Very minor loss of detrimental alteration to one or more characteristics, features or elements. Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements.

Describing the Significance of Effects

2.5.22 The general approach adopted for evaluating the significance of effects is outlined in Table 2-6 below. A combination of the magnitude of the impact under consideration and the sensitivity of the receiving environment determines the significance of effect. For some specialist topics, additional categories have been added where a greater level of definition is required. It should be noted that this approach provides a general framework but should not be treated as a simple matrix; professional judgement is applied in all cases.

Table 2-6 Approach to the Assessment of Significance

Magnitude	Sensitivity or Value of Receptors				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible

Magnitude	Sensitivity or Value of Receptors				
Negligible	Minor	Minor	Negligible	Negligible	Negligible

2.5.23 The significance of the effects arising from the Proposed Development is reported using a seven-point scale, as set out in Table 2-7. Effects predicted as likely to be Negligible or Minor are considered to be 'Not Significant'. Effects assessed as Moderate or Major are considered to be 'Significant'.

Table 2-7 Significance Classifications

Classification	Description	Significant
Major (adverse or beneficial)	A large and/or detrimental change to a valuable/sensitive receptor; likely or apparent exceeding of applicable (often legal) threshold or a major departure from national targets. A large and beneficial change, resulting in improvements to baseline conditions whereby previously poor conditions are replaced by compliance with accepted (often legal) thresholds or a major contribution is made to national targets. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or local scale. Major effects may relate to impacts on resources or features which are rare and cannot be relocated, or if lost, cannot be replaced.	Yes
Moderate (adverse or beneficial)	A medium scale change which, although not beyond an accepted (often legal) threshold, may still considered to be generally unacceptable, unless balanced out by other significant positive benefits of the development. Likely to relate to departure from relevant planning policy, rather than legal compliance. A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets are contributed to. These effects, if adverse, are likely to be important at a local or district scale and on their own could have a material influence on decision-making.	Yes
Minor (adverse or beneficial)	A small change that, whilst adverse, does not exceed accepted thresholds, legal or guideline standards. Unlikely to be a departure from planning policy. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues but are typically unlikely to be critical in the decision-making process.	No
Negligible	A very small change that is so small and/or unimportant that it is not a key factor in the overall balance of issues Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.	No

- 2.5.24 A significant adverse effect is not necessarily one that would make the Proposed Development unacceptable, nor is a significant beneficial effect necessarily one that would make it acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties, in particular decision makers, are aware of the likely environmental effects (in particular those which are likely to be significant) of the Proposed Development and consider these alongside other material considerations in determining the application for planning permission.
- 2.5.25 In subsequent chapters of this EIAR the general criteria described above have been made more specific for each aspect of the environment based on relevant standards or guidelines. A detailed explanation of the approach to assessing impacts and the specific criteria to be used for each aspect is set out in later chapters.

Approach to Mitigation

- 2.5.26 Some mitigation measures are embedded within the design of Proposed Development, whilst others may require adherence to particular constraints on construction methods or mode of operation. The final assessment of residual significance will take into account the mitigation measures and constraints that have been incorporated into the Development. The likely effects taking account of mitigation are referred to as the likely residual effects.
- 2.5.27 A standard hierarchal approach to the development of mitigation measures has been followed with the aim of ‘designing out’ adverse effects as much as practicable (avoiding, preventing or reducing adverse effects) as well as seeking opportunities to enhance beneficial effects. The EIA has largely been undertaken in parallel with the design of the Proposed Development providing opportunities to incorporate mitigation measures into its design or how it will be constructed.
- 2.5.28 The following approach has been used for developing and categorising mitigation:
- **Design Measures:** These are measures embedded in the design of the Proposed Development that may inform/constrain the detailed design and may also influence its operation. These measures are considered in the preliminary assessment of likely significant effects prior to any additional mitigation (where appropriate).
 - **Construction Measures:** These are measures embedded into how the Proposed Development will be constructed and typically relate to standard good practice. These measures are considered in the preliminary assessment of likely significant effects prior to any additional mitigation (where appropriate).
 - **Additional Measures:** These are other measures which have been identified following the preliminary assessment of effects and could include additional design or construction measures and result in the identification of residual effects i.e. those remaining after the application of all mitigation.
 - **Compensation Measures:** These are measures which may be implemented in the event that a significant residual effect cannot be sufficiently mitigated. These measures are not considered within the assessment rather, where appropriate, identified after it.

- 2.5.29 The EIAR also identifies where it is considered appropriate to undertake monitoring as part of construction and/or operation of the Proposed Development. Monitoring provides a mechanism to take remedial action in the event that unforeseen significant effects occur or mitigation is not effective.

2.6 Level of Design Information

- 2.6.1 A detailed design has been developed for the applications. It forms the basis of the description in chapter 4 and the basis of assessment in chapters 6-13. The design described in this EIAR is considered to present a realistic worst-case scenario and thereby ensures that the assessment considers the realistic worst case in terms of likely significant environmental effects. Where appropriate, assessments set out specific parameters or assumptions related to the Proposed Development which have informed their assessment.

2.7 References

Ref 2.1 National Planning Framework 4 (NPF4) (2023) Scottish Government,
<https://www.gov.scot/publications/national-planning-framework-4/>

3 Site Selection and Alternatives

3.1 Introduction

- 3.1.1 Regulation 5(2) and Paragraph 2 of Schedule 4 of the TCP EIA Regulations (Ref 1.7) and EW EIA Regulations (Ref 1.9) requires EIA Reports to provide “*a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment*”.
- 3.1.2 This chapter sets out the approach to identifying and assessing alternatives with reference to established routeing and siting practices in line with SP Transmission’s statutory duties under the Electricity Act 1989 (Ref 1.2) as well as describing the alternatives considered and why the Proposed Development was selected.

3.2 Do Nothing

- 3.2.1 A ‘Do Nothing’ or ‘Delay’ option would be inconsistent with SP Transmission’s various statutory duties and licence obligations. The Proposed Development is required to help enable growth in renewable electricity and support the transition to net zero also alleviating constraints on the electricity transmission system. The Proposed Development forms part of ongoing reinforcement of the electricity transmission network, facilitating increased capacity and improved operational resilience. By uprating and reconfiguring existing overhead line infrastructure, the project contributes to maintaining a secure and reliable supply of electricity, which is essential to national energy security. As a result, a ‘Do Nothing’ or Delay’ option was discounted.

3.3 Consideration of Alternative Substation Sites

Overview

- 3.3.1 SPEN’s approach to the development of new electricity transmission infrastructure is set out in ‘*Major Infrastructure Projects: Approach to Routeing and Environmental Impact Assessment*’ (Ref 3.1). It describes their general approach to the routeing and siting of new electricity transmission infrastructure taking account of SP Transmission’s statutory duties and licence obligations. This requires a range of environmental, technical and economic factors to be considered and balanced. The document also sets out established industry practices that are applied to the routeing of overhead lines and siting of substations, known as the Holford Rules and Horlock Rules respectively. Copies of these are contained in Volume 3 Appendix 3.1.

General Siting Considerations

3.3.2 In line with SP Transmission's statutory duties and licence obligations and drawing upon established practice, siting considerations comprise environmental, technical and economic factors.

- Environmental factors: substation siting must take account of alternative sites' potential environmental impacts. Following SP Transmission's statutory duties and licence obligations this is interpreted as seeking to preserve features of natural and cultural heritage interest and to do what SP Transmission reasonably can to mitigate any effects that delivery of the proposal on the alternative sites would have on such features as well as more widely taking account of the potential impact on the environment and people.
- Technical factors: site options must be technically feasible. This is interpreted as it must be technically feasible to build, operate and maintain substation sites. Technical considerations include matters which would affect these aspects for example safety considerations as well as existing topography, ground conditions and accessibility.
- Economic factors: site options must be economically viable taking account of other siting considerations. This does not necessarily mean the lowest cost option is preferred, rather the relative difference in costs must be considered having in relation to the environment and technical benefits or disbenefits of alternative options.

Established Practice for Substation Siting

3.3.3 Guidelines, known as the 'Holford Rules' (Ref 3.2), regarding the routeing of high voltage overhead lines were developed in the late 1950s. While focused on overhead line routeing, reviews of the Rules were undertaken in the early 1990s by the then National Grid Company (NGC) Plc. (now NGET) and in 2003 by Scottish Hydro Electric Transmission Limited (SHETL). These reviews included the addition of supplementary notes and clarifications including supplementary notes with regard to the siting of the substations which are set out below:

3.3.4 'Supplementary Notes on the Siting of Substations'

- a. *Respect areas of high amenity value (see Rule 1) and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area.*
- b. *Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas.*
- c. *Use space effectively to limit the area required for development, minimizing the effects on existing land use and rights of way.*
- d. *Alternative designs of substations may also be considered, e.g. 'enclosed', rather than 'open', where additional cost can be justified.*
- e. *Consider the relationship of towers and substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints.*
- f. *When siting substations take account of the effects of line connections that will need to be made.'*

3.3.5 In addition to the Holford Rules, guidelines to inform the siting and design of substations, known as the Horlock Rules (Ref 3.3) were devised in 2003 and updated in 2006 by NGC. The objective of the guidelines is to mitigate the environmental effects of substations as far as reasonably possible through site selection and design. In summary the Horlock Rules promote consideration of the following factors:

- **Overall System Options and Site Selection:** In the development of system options including new (or replacement) substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.
- **Amenity, Cultural or Scientific Value of Sites:** The siting of new (or replacement) National Grid Substations, cabling sealing end (CSE) compounds and line entries should as far as reasonably practicable seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections. Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable.
- **Local Context, Land Use and Site Planning:** The siting of Substations, extensions and associated proposals should take advantage of the screening provided by landform and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum. The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum. The land use effects of the proposal should be considered when planning the siting of Substations or extensions.
- **Design:** In the design of new substations or line entries, early consideration should be given to the options available for terminal towers, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum. Space should be used effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation. The design of access roads, perimeter fencing, earthshaping, planting and ancillary development should form an integral part of the site layout and design to fit in with the surroundings.
- **Line entries:** In open landscape especially, high voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance. The inter-relationship between towers and substation structures and background and foreground features should be studied to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.

Alternative Technologies

- 3.3.6 There are broadly two main types of substation; those which use Air Insulated Switchgear (AIS) and those which use Gas Insulated Switchgear (GIS).
- AIS substations use air as the insulation medium for electrical equipment. Equipment is predominantly located outdoors requiring a larger footprint to ensure the necessary safety clearance areas between equipment.
 - In GIS substations some equipment including switchgear can be located within buildings as it uses gas as the insulation medium. This enables safety clearance areas to be reduced meaning that the footprint of a GIS substation is therefore significantly smaller than that of an equivalent AIS substation.
- 3.3.7 For all of its new substations, SP Transmission evaluates the merit of both AIS and GIS technology. This includes but is not limited to consideration of environmental impacts, land availability, technical considerations such as required switchgear rating and the economics of each option. In relation to KINN, SP Transmission has identified GIS as the preferred technology. In considering the alternative sites described below SP Transmission concluded that none of these locations could accommodate the footprint of a new 400kV substation utilising AIS.

Alternative Substation Sites

Overview

- 3.3.8 Alternative substation sites were identified by SP Transmission in both greenfield and brownfield settings considering the technical requirements such as substation footprint as well as:
- Their proximity to the existing overhead lines (XL, ZCN and ZCS routes) which would be connected to the substation noting that it is preferable to minimise the requirement to reconfigure or extend these overhead lines; and
 - Their proximity to the existing Kincardine Substation, which requires an underground cable connection between it and the Proposed Development for network security reasons in the event of an outage on XL route (i.e. it is not integral to the ordinary operation of the Proposed Development).
- 3.3.9 The location of alternative sites is shown in Figure 3.1 Alternative Substation Sites. Seven sites, including how they would be connected to the existing network, were evaluated considering environmental, technical and economic factors in line with SP Transmission's statutory duties. SP Transmission's appraisal of alternatives is contained in Appendix 3.2.
- 3.3.10 As part of the consideration of alternatives for this EIAR, AECOM undertook a further review of environmental and planning considerations alongside SP Transmission's original appraisal. The following sections set out the key findings of appraisal undertaken by AECOM in relation to each site.
- Site 1. New substation at the former Paper Mill site near to the Kilbagie Crossing
 - Site 2. New substation on the northeast of the Kilbagie Crossing

- Site 3 New substation on the southeast of the Kilbagie Crossing at Windyhill Farm
- Site 4. New substation west of the A876
- Site 5. New substation in the Longannet area
- Site 6. New substation at the existing Kincardine Substation
- Site 7. New substation on the southwest of the Kilbagie Crossing

Site 1. Northwest of Kilbagie Crossing at the former Paper Mill

- 3.3.11 Site 1 is located on the former paper mill site to the north of the existing ZCN/ZCS overhead line routes on land between the A876 (to the west) and the A977 to the east. A waste management facility currently occupies Site 1. While its historic and more recent industrial use is considered to be compatible with a substation, the existing facility would require to be displaced as there is insufficient space for both it and the substation to occupy Site 1.
- 3.3.12 The substation has a larger footprint than the existing facility and would be more prominent in the setting of two adjacent listed buildings; Mill House, a grade C listed building to the immediate north of Site 1 (close to the site boundary) and Kilbagie House, a grade B listed building lying approximately 50m north of Site 1. Kilbagie House is identified on the Buildings at Risk Register (BARR). The proximity of Site 1 to designated heritage sites means that development of the substation on Site 1 is likely to result in significant effects on the setting of the adjacent listed buildings that could be avoided by siting the substation elsewhere.
- 3.3.13 While Kilbagie House is unoccupied there is property to the north/northwest of Site 1 which appears to be in residential use. A substation at Site 1 would be within approximately 100m of the property with potential amenity impacts including noise and visual effects. There is some additional land in the intervening area which could be used for landscape planting, however, this is unlikely to prevent permanent effects due to size of the substation and proximity to the property.
- 3.3.14 The overhead line works associated with a substation on Site 1 are unlikely to result in any additional environmental impacts other than those on the listed buildings, however, works associated with the XL route are considered to be more technically constrained due to the distance between the site and the overhead line. The connection between Site 1 and the existing Kincardine Substation would require to be by underground cable due to a number of constraints. While environmental impacts are largely limited, there would be increased temporary disturbance associated with cable installation along the A977.
- 3.3.15 In planning terms Site 1 is located entirely within Clackmannanshire. Site 1 is subject to an allocation in the Clackmannanshire Local Development Plan (LDP (Ref 3.4); policy B11 covering business, industrial, storage or distribution uses. While a substation does not fall explicitly within those use classes it would not prevent an application being made, however, it may be considered a departure from the LDP.
- 3.3.16 Overall while Site 1 benefits from close proximity to the existing overhead lines the substation is to be connected to, and benefits from existing access via the A977, it is not considered

preferable due to the likely impact on the setting of adjacent listed buildings, likely impact on amenity and the requirement to displace the existing waste management facility.

Site 2. Northeast of Kilbagie Crossing near Tulliallan Farm

Site 2 is located to the east of where the existing overhead lines cross at Kilbagie with the XL route to the immediate north and the ZCN/ZCS route to the immediate south. Site 2 is an unoccupied area of land located to the south of the access road to an operational quarry site and north of Tulliallan Golf Course. It currently comprises mature woodland identified in the Native Woodland Survey of Scotland (NWSS) (Ref 3.5) as native birchwood. Land is in agricultural use and used for grazing livestock.

- 3.3.17 The development of a substation at Site 2 would require the removal of all of the woodland which is around 4ha. Development of Site 2 would have localised impacts on landscape through the introduction of the substation and the loss of woodland, as well as on ecology through the loss of habitat. It is more distant to the cultural heritage constraints such as the listed buildings located in the vicinity of Site 1 so potential setting effects are not considered to be a significant constraint.
- 3.3.18 Due to the Site 2's proximity to the existing overhead lines, the works required are limited and unlikely to result in any additional environmental impacts other than those already occurring due to the substation. The connection between Site 2 and the existing Kincardine Substation would require to be by underground cable due to a number of constraints. This would follow the same route as for Site 1 largely following the A977. While environmental impacts are limited, there would be increased temporary disturbance associated with cable installation along the road.
- 3.3.19 In planning terms Site 2 is located entirely within Fife. The site is not subject to any specific allocations or designations in the adopted Fife LDP (). It is located in open countryside so would be subject to policies pertaining to development in the countryside. The loss of woodland would also introduce additional planning policy considerations with respect to the Scottish Government's Control of Woodland Removal Policy and would likely require proportionate compensatory planting which would increase the amount of land required for development, if an off-site solution could not be agreed. Loss of these trees would also be contrary to the intentions of policy 6 of National Planning Framework 4 (Ref 2.1), which seeks to protect and expand forests, woodland and trees.
- 3.3.20 Site 2 benefits from close proximity to the existing overhead lines and direct access from the A977, however, it is not considered preferable due to the loss of a relatively large area of mature woodland which would result in landscape and ecology effects which could otherwise be avoided by siting the substation elsewhere.

Site 3. Southeast of Kilbagie Crossing near Windyhill Farm

- 3.3.21 Site 3 is located on agricultural land to the east of Tulliallan Garden and Designed Landscape and west and north of woodland which is identified on the Ancient Woodland Inventory as being long established of plantation origin. The ZCN/ZCS overhead line routes lie to the

immediate east/northeast of the site, however, XL route is located over 1 km away to the northwest.

- 3.3.22 The existing woodland would provide some screening of Site 3 particularly in views from the west, however, it would be located close to residential properties at Windyhill Farm with increased potential for impacts on amenity including noise and visual effects. Tulliallan Castle Scheduled Monument lies approximately 1.5km to the west of Site 3 and could experience some setting impacts, however, these may be partly mitigated by the existing woodland screening around the monument. The existing land use at Site 3 is predominantly agricultural, however, there is a single wind turbine to the south of the farm. In order to locate the substation on Site 3 and ensure proximity to the ZCN/ZCS overhead line, the existing wind turbine would likely need to be relocated further west or removed.
- 3.3.23 While Site 3 is adjacent to the ZCN/ZCS overhead lines it would require underground cable routes to connect to the XL route at the Kilbagie Crossing and the existing Kincardine Substation. In order to connect to the XL route, the underground cable route would either cross part of Tulliallan Castle Garden and Designed Landscape or Tulliallan Golf Course or require a significantly longer, less direct route around them. In order to connect to the existing Kincardine Substation, the underground cable route would cross part of Tulliallan Castle Garden and Designed Landscape as well as the Police Scotland College campus at Tulliallan. Routeing an underground cable through these areas, in particular the Garden and Designed Landscape, is not considered preferable due to the environmental impact which would occur. Site 3 is also constrained in terms of access as it would require the use of the access to Windyhill Farm or to the Police College to be used and also extended.
- 3.3.24 In planning terms Site 3 is located entirely within Fife. It is not subject to any specific allocations or designations in the adopted Fife LDP. It is located in open countryside so would be subject to policies pertaining to development in the countryside.
- 3.3.25 Overall Site 3 is not considered to be preferable due to the potential impacts of the substation on existing land use and amenity as well as the impacts of underground cable connections on Tulliallan Garden and Designed Landscape.

Site 4. West of the A876

- 3.3.26 The site is located on agricultural land used for crop growing to the immediate west of the A876. The existing ZCN/ZCS overhead line route is routed to the immediate north of the site, however, XL route lies 500-600 m to the east on the other side of the A876.
- 3.3.27 Site 4 is within a prominent location on relatively flat low-lying land with very little existing vegetation or woodland to screen or filter views. As a result, it is considered to have greater potential for significant landscape and visual effects compared to alternative sites. There are residential properties in relative close proximity to the west, north-west and south-west of the site which could experience amenity impacts including visual and noise effects. There are scheduled monuments approximately 500-600m to the southwest (Kennetpans Distillery) and 600-700m southeast (Tulliallan Castle) which could experience setting impacts, however, existing woodland may mitigate this in relation to the latter. Part of the Firth of Forth Special

Protection Area (SPA) and Site of Special Scientific Interest (SSSI) lies within approximately 500 m of the site. While direct impacts on the designated site would be avoided there is the potential to affect its qualifying species through disturbance.

- 3.3.28 The ZCN/ZCS overhead lines lie to the immediate north of the site and new turn-ins would be directly visible from residential properties to the north/north-west. Site 4 would require underground cable routes to connect to the XL route south of the Kilbagie Crossing and to the existing Kincardine Substation. While it is directly west of the A876, access is considered to be complex due to the requirement for a new junction on an existing A-road with any access road also requiring a new watercourse crossing of the Canal Burn which flows parallel to the road.
- 3.3.29 In planning terms Site 4 is located entirely within Clackmannanshire. It is located in open countryside so would be subject to policies pertaining to development in the countryside.
- 3.3.30 Overall Site 4 is not considered to be preferable due to the potential impacts of the substation on landscape character, the amenity of nearby residential properties as well as its relative increased proximity to sites designated for cultural heritage and ecological reasons.

Site 5. At or near Longannet former Power Station

- 3.3.31 The existing Longannet Power Station site is subject to an allocation in the Fife LDP (Ref 3.6). While this refers to energy-related re-development it also places an emphasis on employment uses. A new substation is not likely to provide any significant long-term employment opportunities and therefore development of a substation on the former power station site would likely be considered a departure from the LDP. The site is also subject to planning permission in principle relating to the redevelopment of the site for a range of commercial uses including business, general industrial and storage and distribution.
- 3.3.32 As a result, two sub-options were identified for Site 5, one to the west of the ZCN/ZCS overhead line and one to the east of the ZCN/ZCS overhead line. Both sites are located on land to the immediate north of the former power station site on land which is used for agricultural purposes, typically for grazing livestock.
- 3.3.33 Site 5 lies close to the River Forth/Firth of Forth in an area identified as being at high risk of coastal flooding on SEPA's Flood Risk Map for Planning. Development of this site would require works such as land raising to mitigate flood risk and protect the substation. Land to the north of Site 5 is screened by woodland which is identified on the Ancient Woodland Inventory. Subject to precise siting there is the potential to impact part of the designated woodland. A high-pressure gas pipeline also traverses this area, placing technical limitations on both sub-options.
- 3.3.34 Due to the distance between XL overhead line route and Longannet (approximately 4km), the XL route would require to be turned onto ZCN/ZCS overhead lines. The location of these turns and associated overhead lines is in proximity to constraints including Tulliallan Golf Course, Tulliallan Castle Scheduled Monument and Tulliallan Garden and Designed Landscape increasing the potential for environmental impacts.

- 3.3.35 Overall Site 5 is not considered preferable due to flood risk and the potential environmental impacts of the substation and associated overhead line and underground cable works, as well as proximity to a gas pipeline.

Site 6. At or near existing Kincardine Substation

- 3.3.36 Site 6 lies adjacent to the existing Kincardine Substation on the former Kincardine Power Station site immediately adjacent to the River Forth/Firth of the Forth.
- 3.3.37 Its proximity to the existing substation provides opportunities to effectively integrate it into the landscape compared to alternatives located in more characteristically rural or farmland areas to the north. Existing woodland to the north of the site would also help to screen and/or filter views of it from locations to the north/northeast and northwest. Site 6 is located close to parts of the Firth of Forth SPA, SSSI and Ramsar but would not be directly impacted. While direct impacts on the designated site would be avoided there is the potential to affect its qualifying species through disturbance for example construction noise or lighting.
- 3.3.38 Site 6 lies directly adjacent to the River Forth/Firth of Forth in an area identified as being at high risk of river and coastal flooding on SEPA's Flood Risk Map for Planning (Ref 3.7). Development of Site 6 would require significant land raising to protect the substation similar to what was constructed for the existing Kincardine Substation. The extent of flood protection required was identified as a significant environmental, technical and cost constraint due to the land required for the new substation and associated flood protection measures.
- 3.3.39 While the XL overhead line route is in close proximity to Site 6 new underground cable connections would be required to connect to the ZCN/ZCS routes in the Kilbagie area. Underground cable routes from Kincardine to Kilbagie would be space constrained due to a combination of the physical and environmental constraints which are present. Access to the site from the A977 is well established and not considered to constrain development of the site, however, given the requirement to increase ground levels to protect the site from flooding, Site 6 is likely to require more vehicle movements compared to alternatives.
- 3.3.40 In planning terms Site 6 is located entirely within Fife. The Fife LDP identifies the wider former power station site as a safeguarded employment area. A new substation is not likely to provide any significant long-term employment opportunities and therefore development of a substation on Site 6 would likely be considered a departure from the LDP.
- 3.3.41 Overall Site 6 is not considered preferable due to a combination of flood risk and potential environmental impacts of the associated overhead line and underground cable works.

Site 7. Southwest of the Kilbagie Crossing

- 3.3.42 Site 7 is located to the south of the ZCN/ZCS overhead lines and west of the XL overhead line close to where the lines cross. The site comprises agricultural land which is used for arable purposes.
- 3.3.43 Electrical infrastructure including the overhead lines and sealing end compounds are a well-established feature in the landscape which provides some opportunities to integrate a substation into the landscape. The Firth of Forth SPA and SSSI is located approximately 600m to the south/southwest of the site but should not be directly impacted. While direct impacts

on the designated site would be avoided, the relatively increased proximity increase the potential to affect its qualifying species through disturbance for example construction noise or lighting. Tulliallan Castle, a scheduled monument, lies approximately 400m to the south of the site and may experience some setting impacts, however, the existing woodland in which the Castle is sited may help to reduce these to some extent.

- 3.3.44 The overhead line works associated with a substation on Site 7 are unlikely to result in any additional environmental impacts due to the proximity of the ZCN/ZCS and XL routes. An underground cable connection would be required to the existing Kincardine Substation, however, compared to other options a relatively direct route crossing agricultural land and avoiding environmental designations is possible. The proximity of the site to the A876 as well as Hawkhill Road to the south provides opportunities for access.
- 3.3.45 Land to the south of the site is subject to consent for a Battery Energy Storage System (BESS) so the development of energy infrastructure in this area has some recent precedent in relation to planning. Site 7 is located on the boundary between Clackmannanshire and Fife meaning a planning application would require to be submitted to both authorities. The site is not subject to any allocation or designation in either Fife or Clackmannanshire's LDPs and would be classed as countryside so would be subject to policies pertaining to development in the countryside.
- 3.3.46 Site 7 benefits from close proximity to the existing overhead lines and from existing access. While it does not avoid environmental impacts, it is generally distant from environmental designations or constraints as well as residential properties and/or there is some potential for mitigation.

Summary of Alternative Sites Appraisal

Table 3-1 Summary of Alternative Sites Appraisal

Alternative	Summary
Site 1. New substation at the former Paper Mill site near to the Kilbagie Crossing	This option would affect existing land use and be in closer proximity to listed buildings and residential property with increased potential for impacts. It would require longer underground cable circuits to the existing Kincardine substation and more extensive overhead line works to make the necessary connections to the existing XL Route.
Site 2. New substation on the northeast of the Kilbagie Crossing	The option would require the removal of all native woodland and have localised impacts on landscape on ecology. It would require longer underground cable circuits to the existing Kincardine substation and would also result in the loss of the native woodland in the area.
Site 3 New substation on the southeast of the Kilbagie Crossing at Windyhill Farm	The substation location largely avoids environmental designations, however, it would require significantly longer underground cable circuits to the existing Kincardine substation potentially crossing Tulliallan Garden and Designed Landscape as well as require new access to be established. Additional underground cable circuits would also be required to make the necessary connections to the existing XL Route. Development of a substation in this location is

Alternative	Summary
	considered likely to require more complex and expensive earthworks to construct the substation platform.
Site 4. New substation west of the A876	The option is within a prominent location with greater potential for significant landscape and visual effects compared to alternative sites. Additional underground cable circuits are expected to be required to make the necessary connections to the southern section of the existing XL Route. This location could also require the diversion of the Canal Burn and flood risk mitigation works due to the potential issues associated with coastal and surface water flooding.
Site 5. New substation in the Longannet area	This option is located in an area at risk of flooding and would require works such as land raising to mitigate flood risk and protect the substation. The site is also located in area allocated in the Fife Local Development Plan for employment. It would require significantly longer underground cable circuits to the existing Kincardine substation and complex overhead line diversion works around the Kilbagie Crossing.
Site 6. New substation at the existing Kincardine Substation	This option is not considered preferable due to a combination of flood risk, the extent of flood protection measures that would be required and potential environmental impacts of the associated with the scale of overhead line and underground cable works that would be required.
Site 7. New substation on the southwest of the Kilbagie Crossing	This option is considered to be preferable. It is generally located away from sensitive receptors such as environmental designations or property and compared to other options minimises the extent of overhead line and underground cable works required.

Proposed Substation Site

- 3.3.47 Overall, taking account of and balancing environmental, technical and economic factors in line with SP Transmission's statutory duties and licence obligations means that site 7 to the southwest of the Kilbagie Crossing is preferred. The size of the proposed substation has been determined by the operational requirements of the electricity transmission network, including the need to accommodate switchgear, transformers, associated electrical equipment, access routes, drainage infrastructure and areas for future network connections.
- 3.3.48 It has been designed using GIS technology. Compared with a conventional AIS arrangement, GIS requires substantially less land to accommodate the same network capacity and functionality. The use of GIS has therefore reduced the overall footprint of the permanent infrastructure and represents an important design measure to minimise land take and associated environmental effects.
- 3.3.49 The substation layout has been developed to make efficient use of the site while maintaining the safety clearances, operational access and maintenance requirements necessary for the long-term operation of the transmission network. The resulting substation platform represents the minimum practicable area required to safely accommodate the proposed equipment and

provide flexibility for future network reinforcement. This approach is consistent with the mitigation hierarchy by avoiding and reducing impacts through design.

- 3.3.50 A key benefit of site 7 is its proximity to the existing overhead lines which require to be connected to the substation as this reduces the works required to reconfigure existing overhead lines and does not require any significant increase in the length of overhead lines in the area. Alternative sites are typically located further away from one or all of these overhead lines increasing the technical complexity, cost and/or environmental impact of connecting them to the new substation. The only other sites in such close proximity are Site 1 and Site 2 which are considered to be less preferable due to the environmental impact of siting the substation; at Site 1 its proximity to and impact on listed buildings and existing land use and at Site 2 the requirement to remove native woodland and impact on landscape and ecology. Alternative sites (sites 3, 4, 5 and 6) are only close to one of the overhead lines which require to be connected to it, and the sites or the required connections are considered to be more technically constrained and/or have a greater environmental impact compared to site 7. Site 6 at the existing Kincardine Substation was discounted due to a combination factors linked to flood risk and protection measures including the impact, cost and land required to provide the necessary level of flood protection. For those reasons site 7 is preferred having regard to SP Transmission's statutory duties and forms the basis of the site to which the planning application relates.

3.4 Consideration of Alternative Overhead Line Works

Increase in Operating Voltage

- 3.4.1 Two alternative scenarios were considered; firstly uprating the existing XL overhead line from 275kV to 400kV, or secondly developing a new 400kV overhead line to replace the existing 275kV route which would then be dismantled.

Uprating existing XL route from 275 to 400kV

- 3.4.2 The nature of the works involved in uprating depends on the existing conductors (wires). The operating voltage of some conductors operating at 275kV may be increased to 400kV without the need for physical works to be undertaken. Where the existing conductors are not capable of operating at 400kV they would need to be replaced (referred to as 'reconductoring').
- 3.4.3 In the case of XL route, the existing conductors are capable of operating at 400kV, however, as set out in the noise assessment (chapter 11), increasing the operating voltage to 400kV also results in an increase in operational noise impacts under certain conditions. While much of XL route traverses sparsely populated areas modelling was undertaken to identify the extent of the noise impact in particular where residential properties could be exposed to greater levels of noise than currently occur. This identified a section of XL route where increased noise impacts would occur and result in likely significant effects on a single residential property approximately 50-60m east of tower XL17. In considering alternatives for this section which would mitigate the noise, SP Transmission considered:

- Mitigation at Source:

- Replacing the conductors on the affected section of XL route;
- Diverting XL route to increase the distance from noise sensitive receptors; and
- Undergrounding the affected section of XL route.
- Mitigation at Receptor:
 - Providing additional measures at the receptor location
 - Relocating the receptor

3.4.4 With regard to mitigating the impact at source, diverting or undergrounding the existing route would require new infrastructure including overhead line towers and/or sealing end compounds and underground cables which would result in greater environmental impact and increased costs compared to reconductoring. These options are considered to be inconsistent with SP Transmission's statutory duties to 'develop and maintain an efficient, co-ordinated, and economical system of electricity transmission' as well as its obligations under Schedule 9 with regard to the preservation of amenity and therefore were discounted. Replacing the existing conductors with a quieter conductor would reduce the noise such that effects would not be significant, however, this could not be limited the sections of overhead line either side of XL17. Due to technical requirements it would require a longer section of XL route, between XL12 and XL20, to be reconductored.

3.4.5 With regard to mitigating the impact at the receptor providing additional measures at the property to reduce noise, for example additional window glazing, would not be effective at reducing the noise impact due to the nature of overhead line noise. Relocating the receptor would mean that there is no impact, however, this would require SP Transmission to acquire the affected residential property.

Developing a replacement 400kV overhead line route

3.4.6 Replacing the existing XL route with an entirely new 400kV overhead line route was not considered to be a reasonable alternative. It is generally preferable, and in keeping with SP Transmission's statutory duties to modify the existing network before developing new infrastructure. As the existing XL route is capable of being modified to operate at 400kV, it was not considered reasonable or proportionate to develop an entirely new overhead line route. A replacement OHL route would be expected to give rise to much greater environmental effects, as there would be significantly greater construction works involved. As above this option is inconsistent with SP Transmission's statutory duties to '*develop and maintain an efficient, co-ordinated, and economical system of electricity transmission*' as well as its obligations under Schedule 9 with regard to the preservation of amenity and therefore was discounted.

Proposed Upgrading Strategy

3.4.7 Taking account of the above, the proposed approach to upgrading XL route from 275 to 400kV is to utilise existing infrastructure and reductor the section between tower XL20 south of Gartgreenie, off Laurie Place, and tower XL12 north of the A907. Reconductoring a section of XL route is considered to be a realistic worst case in EIA terms and therefore forms the basis of the assessment reported in this EIAR, however, having regard to its statutory duties, SP

Transmission is simultaneously engaging with the owner of the residential property regarding its potential acquisition as this would remove the impact and negate the requirement to reconductor XL route as it is already capable of operating at 400kV.

Connection to Proposed Kincardine North Substation

- 3.4.8 The design of the connection works has been informed by and is dependent on the siting of the proposed Kincardine North Substation which is subject to separate planning applications to Fife and Clackmannanshire Councils under the Town and Country Planning (Scotland) Act 1997 (Ref1.1). Alternative options to connect the existing XL, ZCN and ZCS overhead lines to the proposed substation were considered as part of the identification of the proposed substation site.
- 3.4.9 As far as possible, taking account of other factors, KINN was sited to reduce the works required to reconfigure the existing overhead lines so that there is a minimal increase in the length of overhead lines in the area. Alternative sites are typically located further away from one or all of the XL, ZCN or ZCS overhead line routes increasing the amount of new infrastructure required to connect them to the proposed substation. This increases the technical complexity, cost and/or environmental impact of connecting them to the new substation such that they are less preferable. KINN is proposed at Kilbagie to the south and west of where XL route is crossed by ZCN and ZCS routes and reducing the amount of new infrastructure required.

Proposed Connection Design

- 3.4.10 An assessment was undertaken of different tower configurations, conductor arrangements, and connection approaches to determine whether the required electrical connections could be achieved with fewer or smaller structures. However, the proposed design reflects the need to safely and efficiently connect the existing XL, ZCN and ZCS overhead lines to the new Kincardine North Substation, whilst complying with statutory electrical clearances, technical requirements, and operational standards. The introduction of additional towers is necessary to:
- Facilitate changes in alignment and elevation required to achieve a safe and compliant connection into the substation;
 - Maintain appropriate electrical clearances between circuits and to ground;
 - Accommodate the physical and operational requirements associated with terminating and reconfiguring multiple existing overhead line circuits; and
 - Minimise construction and operational risks, including those associated with complex span lengths or non-standard tower loading.

Proposed Connection Strategy

- 3.4.11 KINN is located to the south of the ZCN and ZCS overhead line routes which would be diverted into the substation on its northeast and northwestern sides. The proposed substation lies to the west of XL overhead line route. It would be diverted into the substation on its northeastern and southwestern sides. Overall, there is an increase in the number of overhead line towers,

however, these are localised around the proposed substation and so do not increase the length of the overhead line routes.

3.5 Consideration of Alternative Access

- 3.5.1 As part of the access strategy for Kincardine North, SPEN considered alternative traffic management arrangements to balance construction access requirements with the need to manage impacts on the local road network. A one-way traffic arrangement, with access from the A876 and egress via Hawkhill Road, was considered with stakeholders as a potential means of improving traffic flow and reducing two-way construction movements on constrained local roads. Following further engagement with Transport Scotland and Fife Council, and taking account of the applicable trunk road access requirements, routine construction access from the A876 is not being progressed. The proposed access strategy therefore relies on Hawkhill Road for general construction and permanent operational access, supported by road widening, traffic management measures, and pedestrian/cycle segregation where required, while the A876 access is retained only for abnormal indivisible loads (AILs), emergency access/egress or future larger-scale maintenance such as transformer replacement, subject to the necessary approvals and controls.

3.6 Consideration of Alternatives for the Scottish Power Distribution Works

- 3.6.1 The new Kincardine North Substation requires removal of existing 11kV overhead line and replacement with underground cables. Underground cables were the only suitable option at this site due to technical and safety reasons. The removal of existing wood pole overhead line also helps to reduce wirescape-related impacts from the number of overhead line in the area. In order for the underground cables to operate safely, multiple switching stations and protection apparatus are required to provide the same level of connectivity and safety. The location of the underground cables is determined by safety clearances from the supply to adhere to Scottish Power Distribution's Earthing Policy (Ref 3.8).

3.7 References

- Ref 3.1 Approach to Routeing and Environmental Impact Assessment: 2nd version (2020) SP Energy Networks,
https://www.spenergynetworks.co.uk/userfiles/file/SPEN_Approach_to_Routeing_Document_2nd_version.pdf
- Ref 3.2 The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with NGC 1992 and SHETL 2003 Notes) SPEN
<https://www.spenergynetworks.co.uk/userfiles/file/Appendix-A-Holford-Rules.pdf>
- Ref 3.3 Horlock Rules (2003) National Grid Company
<https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf>

Ref 3.4 Local Development Plan (2015) Clackmannanshire Council,
<https://www.clacks.gov.uk/property/ldpadopted/>

Ref 3.5 Native Woodland Survey of Scotland (2025) Scottish Forestry
<https://www.forestry.gov.scot/native-woodland-survey-scotland>

Ref 3.6 Adopted FIFE Local Development Plan (2017) Fife Council, <https://fife-consult.objective.co.uk/kse/event/30240/section/4395822>

Ref 3.7 Flood Maps (N.B), Scottish Environment Protection Agency (SEPA)
<https://map.sepa.org.uk/floodmaps>

Ref 3.8 LOW VOLTAGE EARTHING POLICY AND APPLICATION GUIDE (2025) SP Energy
Network, <https://www.spenergynetworks.co.uk/userfiles/file/EART-01-002.pdf>

4 Description of the Proposed Development

4.1 Introduction

- 4.1.1 This chapter provides details of the Proposed Development which forms the basis of the assessments reported within Chapters 6-13. It describes the permanent components of the Proposed Development including highlighting any parameters which have been used to inform the Environmental Impact Assessment (EIA). It also describes temporary works required to enable construction of the Proposed Development. A summary of changes to the scope of the Proposed Development have been included at Appendix 4.1.

4.2 Site Description

Kincardine North Substation

- 4.2.1 KINN is located on agricultural land bounded to the west by the A876 and to the east by the Stirling-Alloa-Kincardine railway line. The KINN application boundary is illustrated in Figure 4.1 KINN and is 35.8 hectares (ha) in total. . The majority of site is predominantly flat and low lying with elevations varying between 4.8 and 8.5mAOD within the area where the substation platform is proposed. The Canal Burn follows the KINN boundary in the northwestern corner of the site and crosses part of the KINN boundary before it flows under the A876 through a culvert. An unnamed watercourse lies to the south of the substation where the KINN boundary meets existing woodland to the north of Hawkhill Farm. An existing pond lies to the west/northwest of the substation and is understood to treat runoff from the A876. Currently the majority of the land within the KINN boundary is used for arable farming and therefore there is limited vegetation. A narrow band of woodland is present on the eastern margin of the KINN boundary where it abuts the railway line. A larger area of woodland lies to the south of the KINN boundary separating the site from Tulliallan Castle and Hawkhill Farm buildings to the south. Land to the west of the KINN boundary, between the substation site and the A876, is the subject of planning consent for a Battery Energy Storage System (BESS), known as the Kincardine Grid Services Complex. Existing overhead lines, known as the XL, ZCN and ZCS routes, currently traverse to the north and southeast of the proposed substation, however, these will be diverted into and connected to KINN and are referred to as the Overhead Line Works throughout this EIAR (see Section 4.4 for more information). The KINN boundary extends along Hawkhill Road to the south/southeast of the flyover crossing the A876. There is an existing access to the west of the substation from the A876 via a locked field gate as well as from the south via Hawkhill Road where junction improvements are proposed to facilitate access into the substation. The section of the red line boundary which follows Hawkhill Road extends from the substation in a southeastern direction for approximately 900m where measures are proposed to manage construction traffic. It terminates at the four-way junction

west of the railway line. This section of the site incorporating Hawkhill Road also coincides with a section of National Cycle Network Route 76 and Core Paths R745 and R746.

Overhead Line Works

- 4.2.2 The proposed overhead line works are illustrated in Figure 4.2 Overhead Line Works. These comprise two elements, firstly, an approximate 2.8 km long section of XL route between tower XL20 south of Gartgreenie, off Laurie Place, and tower XL12 north of the A907 in which the existing conductors will be replaced, and secondly the works required to connect the existing XL, ZCN and ZCS overhead line routes to KINN. These works are located to the north and south of the proposed substation where XL route currently passes to the east/south of KINN and ZCN/ZCS passes to the north of the proposed substation. While the majority of the overhead line works are located within the KINN application boundary they extend west across the A876 and east across the Stirling-Alloa-Kincardine railway line to allow for temporary works areas associated with stringing the overhead lines and connecting them into KINN.

Scottish Power Distribution Works

- 4.2.3 The proposed Scottish Power Distribution Works are illustrated in Figure 4.3 Scottish Power Distribution Works. They comprise the removal of existing 11kV wood pole lines within the KINN site and replacement with underground cables. There are two sections of wood pole line to be removed; one running broadly north to south located to the west of KINN and one running broadly west to east across KINN. The north to south section of wood pole line will be replaced with an underground cable which is largely routed on the margins of the KINN application boundary from south of the Canal Burn to west of Hawkhill Farm. The west to east section of wood pole line will be replaced by an underground cable routed within road verges from Tulliallan Poultry Farm along the A977 to Broomknowe to the east of KINN.

4.3 Kincardine North Substation

Overview of the Substation

- 4.3.1 The proposed substation is required as part of upgrades to the electricity transmission system in central Scotland which will reinforce and increase the capacity of the network. While the KINN boundary occupies approximately 35.8ha and comprises the whole agricultural field as well as some adjacent land, the actual permanent substation footprint is much smaller. The substation will be located within a secured fenced platform approximately 193m by 254m (4.97ha, or approximately 14% of the KINN application boundary area). Land outside of the substation platform is used for related development including overhead lines and underground cables, access, drainage and landscaping as well as for temporary compounds and storage during construction.
- 4.3.2 The substation platform is located to the north of the KINN boundary and orientated in a southwest to northeast direction. The platform will be constructed to a finished ground-level of approximately 7.5mAOD, no greater than 1-2m above existing ground levels. The Flood Risk

Assessment (FRA) which accompanies the planning application confirms the substation is not at risk of flooding so does not require substantial works to raise the ground-level.

- 4.3.3 The substation uses Gas Insulated Switchgear (GIS) technology which helps to reduce its overall footprint. This means that part of the substation housing the switchgear will be located indoors within a building while other electrical equipment including busbars and overhead line tower gantries, that the existing overhead lines (XL, ZCN and ZCS) will be connected to, will be located outdoors within the fenced platform. The GIS building is approximately 86.5m by 30.5m by 12.2m. Figure 4.1 KINN & Hawkhill Road Improvements provides an overview of the permanent site layout. In addition to the substation, the design includes access roads, drainage and landscape planting.

Access and Internal Roads

- 4.3.4 Permanent access to KINN will be via a new 600m long road extending east and then northwards from the existing junction with Hawkhill Road north through the site to the substation platform. Additional permanent roads will be constructed outside of the main substation platform to provide access around the KINN site, for example for maintenance of drainage. Additional internal roads will be constructed within the fenced substation platform allowing access to the GIS building and outdoor electrical equipment.
- 4.3.5 The C68, Hawkhill Road will be subject to road widening along the length of the road on its southern side and junction improvements at the junction with Quarry Road and also at the main access point to the proposed substation site. A segregated pedestrian and cycle route is proposed north of the C68, Hawkhill Road.
- 4.3.6 An access road will be constructed from the A876 access point east to the substation platform which will be used for delivery of abnormal loads only. This will require an existing culvert crossing a ditch which drains south from the existing pond to the Canal Burn to be strengthened and potentially widened as well as require a new culvert crossing of the Canal Burn. While this access is temporary to be used for construction it will be left in-situ in for emergency access and egress or in the event access is required from the A876 for larger scale maintenance such as the replacement of transformers.

Drainage

- 4.3.7 For the purposes of the KINN application a preliminary drainage design has been developed. This takes account of the Surface Water Management Strategy (SWMS) which also accompanies the Applications. The drainage design is based on Sustainable Urban Drainage Systems (SUDS) principles.
- 4.3.8 It is proposed that surface water from the hardstanding areas of the site will be conveyed via drainage ditches/swales to a SUDS pond (to the south of the site) where the water will be attenuated, before discharging at a controlled rate to an unnamed watercourse to the south of the site. Access tracks will first discharge to swales adjacent to the roads, before discharging to the SUDS pond. A bunded oil containment system will be installed to collect potential fuel leaks from within the substation platform.

- 4.3.9 Toilets will be installed within KINN. A Packaged Sewage Transfer Plan (PSTP) will be installed as part of this. Foul waste will be discharged to the PSTP, treated with effluent and then discharge to the proposed drainage system.

Landscape Planting

- 4.3.10 A landscape planting scheme has been developed which also accompanies the KINN application. This identifies areas of proposed planting including tree and shrub planting as well as hedgerow creation on the site boundary and grassland planting and reinstatement outside of the substation platform and other hardstanding areas. Proposed tree planting includes some planting on the western side of the site at the proposed access point from A876 and between the approved Kincardine Grid Services complex and KINN, on the northern boundary towards Kilbagie and on the southern boundary supplementing the existing woodland between Hawkhill Farm and KINN. Some tree planting is also proposed on the eastern boundary increasing the depth of existing planting which separates the site from the railway line. Further information regarding landscape planting is contained in Chapter 7.

Ground Improvement Works

- 4.3.11 Subject to further ground investigation, potential ground improvement works including localised grouting to infill and stabilise historic mine workings within the KINN application boundary may be required. The full extent of ground improvement works is subject to further detailed design.

Summary of Permanent Components of KINN

- 4.3.12 Figure 4.1 provides an overview of permanent components of KINN. In summary these include:

- Hardstanding platform up to 4.97 ha on which the substation will be located
- GIS substation comprising a building as well as outdoor electrical equipment
- Internal access roads within the substation platform to allow for maintenance
- Car parking for up to 7no. vehicles including 2no. electric vehicle (EV) charging points
- A 3m high palisade security fencing around the substation platform perimeter
- A post and wire fence up to 3m high located a minimum of 5m beyond the internal palisade fence
- Security measures including motion-sensor lighting and cameras
- Watercourse crossings of an unnamed ditch and the Canal Burn
- Approximately 600 m of permanent road providing access via Hawkhill Road
- Additional permanent access roads within the site
- Localised road widening along Hawkhill Road on its southern side
- Improved junction at Hawkhill Road as means of permanent operational access
- Access road to the A876 for emergency access/egress
- Drainage system including swales, filter drains and SUDS pond

- Landscape planting on the margins of the site to screen, filter and backcloth views
- Construction of a reinforced concrete slab supported by reinforced concrete piles

Summary of Temporary Components of KINN

4.3.13 Figure 4.1 provides an overview of temporary components of KINN required to enable construction. In summary these include:

- Temporary access via the A876 for abnormal loads (transformers) accessing the site from the A876 access point.
- Temporary track running parallel to the north of Hawkhill Road between the site access point and the four-way junction to provide a segregated space for pedestrians and cyclists during construction.
- Temporary construction compound and laydown area including site office and welfare facilities as well as temporary car parking.
- Soil stripping including segregated storage of topsoil and subsoil as well as earthworks as part of site establishment.

4.4 Overhead Line Works (XL/ZCN/ZCS Uprating and Turn-Ins)

The Proposed XL Route Upgrade

4.4.1 The existing XL route is approximately 10km long from XL33 near Blairingone where it crosses from Scottish Hydro Electric Transmission's (SHET) licence area to SPT's licence area to XL001A at the existing Kincardine Substation, adjacent to the River Forth where it terminates. It is largely routed across farmland with approximately 6.8km within Clackmannanshire and the remainder in Fife. The existing route is carried on L2 towers which are typically 45m tall, however, this varies slightly along the route in order to maintain the necessary statutory ground clearances. There are also L8c towers on XL Route with heights of approximately 46m – 49m. An overview of the existing route is shown on Figure 4.2 Overhead Line Works.

4.4.2 The proposed XL route upgrade comprises two key components:

- An increase in operating voltage from 275 to 400kV increasing the capacity of the overhead line between Blairingone and Kincardine. The existing overhead line is capable of operating at 400kV but is not consented to operate at this voltage. However, subject to the potential acquisition of a single residential property, a section of the line comprising nine towers requires to be reconducted with an alternative conductor in order to reduce potential increased noise impacts when operating at 400kV. See Figure 4.2.
- The construction of new terminal towers to turn in and connect the XL overhead line route to KINN as well as the removal and replacement of existing line towers (see Figure 4.2). Overall, one tower is to be removed and four new towers installed. The new L6 towers will be 50-52m high. Temporary masts will be required to enable the continuous operation while permanent towers are constructed to connect to the substation. As illustrated in Figure 4.2 the new towers connecting XL route to KINN are located to the east and south of the proposed substation.

The Proposed ZCN and ZCS Route Upgrade

- 4.4.3 The existing ZCN and ZCS routes are approximately 22km long from Longannet Substation adjacent to the decommissioned Longannet Power Station to Denny North Substation where the ZCN route terminates and the ZCS route connects directly to ZD route (adjacent to Denny North Substation). The existing ZCN/ZCS route crosses four Local Planning Authorities: Fife, Clackmannanshire, Falkirk and Stirling. The existing route is carried on L6 towers which are typically 49m tall, however, this varies slightly along the route in order to maintain the necessary statutory ground clearances. An overview of the existing routes are shown on Figure 4.2.
- 4.4.4 The proposed ZCN and ZCS route upgrades comprise the construction of new terminal towers to turn in and connect the ZCN and ZCS overhead lines to KINN as well as the removal and replacement of existing line towers. Overall, two towers are to be removed and eight new towers installed. The new L6 towers will be 50-52m high. Temporary masts will be required to enable the continuous operation while permanent towers are constructed to connect to the substation. As illustrated in Figure 4.2 the new towers connecting ZCN and ZCS routes to Kincardine North are located to the northeast and northwest of KINN. All temporary masts will be removed after the new permanent towers are constructed and stringing of conductors.

4.5 Scottish Power Distribution Works

- 4.5.1 The proposed Scottish Power Distribution Works are required as a result of KINN. The proposals require removal of existing overhead lines and associated wood poles and replacement with underground cable, and associated works.
- 4.5.2 They comprise:
- An existing section of 11kV wood pole overhead line located on the western side of the KINN application boundary will be removed between south of the Canal Burn (pole 17) and west of Hawkhill Farm (pole 32). This will be replaced by an underground cable route installed within 1.3m wide trench routed along to the west of KINN. The majority of this will be installed by open cut trenching, however, where the cable route crosses an unnamed watercourse at the entrance to the KINN site this could be installed by trenchless methods such as Horizontal Directional Drilling (HDD). A temporary power supply will be provided to the KINN compound via a short tee-off from pole 23. This would be removed when the compound is demobilised.
 - An existing section of 11kV wood pole overhead line which is routed west to east across the KINN application boundary will also be removed. The wood pole overhead line currently supplies properties along the A977 at Broomknowe. This will be replaced by an underground cable route between Tulliallan Poultry Farm and Broomknowe to the east of KINN. The new 11kV underground cable route follows the existing road from the poultry farm to the A977 and is then routed north following the A977 to Broomknowe.
- 4.5.3 The Scottish Power Distribution Works can be found on Figure 4.3 Scottish Power Distribution Works.

4.6 Consent Application Drawings

- 4.6.1 A number of detailed design drawings have been prepared as part of the consent applications. Reference should be made to the drawings listed in Table 4-1.

Table 4-1 Consent Applications – Other Supporting Plans and Drawings

Proposed Development Component	Drawing Details
KINN Substation	Proposed Site plan inc. blue SPT owned areas and council boundaries in green outline.
KINN Substation	Proposed site plan inc. blue outline not inc. council boundaries.
KINN Substation	Location Plan
KINN Substation	Proposed site layout
KINN Substation	Proposed tower elevations at Kincardine North Substation
KINN Substation	Electrical Layout
KINN Substation	Earthworks Platform Cross Sections
KINN Substation	General Arrangement Sheet 1
KINN Substation	General Arrangement Sheet 2
KINN Substation	Sections Sheet 1
KINN Substation	Drainage Arrangement Sheet 1
KINN Substation	Drainage Arrangement Sheet 2
KINN Substation	Construction Areas and Kerbing Sheet 1
KINN Substation	Construction Areas and Kerbing Sheet 2
KINN	3m High Lochrin Bain Combi Security Fence
Overhead Line Works	XL Potential Reconductoring - Access Routes, Pulling Positions & Working Areas
Overhead Line Works	Proposed ZCS, ZCN and XL Route Towers

Proposed Development Component	Drawing Details
Overhead Line Works	Proposed tower elevations at Kincardine North Substation
Overhead Line Works	XL Specific Plan
Overhead Line Works	ZCS Specific Plan
Overhead Line Works	ZCN Specific Plan
SPD Works	Location Plan
SPD Works	Site Plan for proposed cables
SPD Works	Section of typical trench
SPD Works	Existing 11kV wood poles

4.7 Construction of the Proposed Development

Overview of Construction Activities

4.7.1 The construction of the Proposed Development will follow a well-established sequence of activities including the following main activities:

- Pre-construction surveys
- Site establishment and enabling works including establishment of access
- Undergrounding of distribution overhead lines for construction of platform
- Road improvement works including traffic diversion for pedestrian and cyclists
- Earthworks, ground improvement works, piling works and drainage
- Formation of the substation platform and other civil works
- Reconductoring of XL route between towers XL12 and XL20 (if required)
- Construction of the substation building
- Installation of substation electrical plant and equipment
- Construction of temporary masts to divert the existing XL, ZCN and ZCS routes
- Construction of new towers to divert and connect XL, ZCN and ZCS routes into KINN
- Removal of existing towers

- Connection works within the substation
- Commissioning activities
- Removal of temporary construction facilities including temporary masts
- Reinstatement and landscaping

Overhead Line Works

Overview

4.7.2 While increasing the operating voltage along the ZCN and ZCS routes does not require any construction works, localised reconductoring is required on XL route between towers XL12 and XL20. In addition, the Overhead Line Works requires construction of a total of twelve new overhead line towers to connect XL, ZCN and ZCS routes (four per route) to KINN, and removal of three existing towers (one per route).

4.7.3 The Overhead Line Works will be constructed in two discrete packages which can be undertaken separately or concurrently:

- Firstly, the reconductoring of XL route between towers XL12 and XL20. Temporary accesses and working areas will require to be established to enable the works to be undertaken but these will be removed on completion and any land affected reinstated.
- Secondly, the installation of temporary masts to divert the existing XL, ZCN and ZCS overhead lines to enable the lines to continue to safely operate while construction works are undertaken, the construction of new towers to divert and connect XL, ZCN and ZCS routes into KINN and the removal of existing towers.

XL Route Reconductoring

4.7.4 Subject to the potential acquisition of a single residential property, spans between overhead line towers require reconductoring to operate at 400kV and reduce the potential noise impacts of the uprated XL route. The spans on the XL route requiring reconductoring are between XL12 and XL20.

4.7.5 Reconductoring will involve the replacement of existing conductors, fittings, tension and suspension insulators and tension and suspension conductor end fittings. The overhead line will not be operational during reconductoring works which are anticipated to take approximately 20 weeks and comprise the following key stages:

- Installation of temporary access to towers and laydown / storage areas;
- Erection of temporary scaffolding where the reconductoring works cross local roads;
- Delivery of conductors and stringing equipment;
- Insulator and conductor fitting and tensioning; and
- Clearance and reinstatement.

4.7.6 Linesmen will climb each tower and attach a pul-lift from the tower crossarm to conductors. This allows the existing insulator to be unbolted before being lowered to the ground using a tractor and winch. The tractor and winch are then used to lift the new insulator on to the tower cross arm before being attached to the cross arm and conductors. Once the new insulator is

in place, the pul-lift is removed. This process is then repeated for the remaining insulators on the tower.

- 4.7.7 Following commissioning of the uprated overhead line, all equipment and temporary access and construction areas will be removed with the land being reinstated to its former use / condition.
- 4.7.8 Further details on temporary compounds, access, lighting and construction programme can be found within the respective sections below.

Construction of the New Towers to connect XL, ZCN and ZCS to KINN

Foundations

- 4.7.9 The foundation design for the towers forming the proposed new overhead line connections to KINN are subject to detailed design and ground investigation works. Pad and column, micro-pile foundations and rock anchor are all potential construction methods which could be used to install tower foundations. The construction process involved with each of these options are described further below. Final foundation sizing will be determined following ground investigation and detailed design. A worst case footprint has been used for assessment purposes.

Pad and Column

- 4.7.10 Prior to construction, a maximum of 50m x 50m working area will be established complete with access and laydown area for welfare, plant and materials. See Section 'Temporary Construction Compounds & Working Areas' below for further details on temporary working areas. Each foundation will be excavated to a typical depth of 4m with temporary shoring installed to allow for safe working. On average, dimensions for each foundation are expected to be approximately 4m x 4m x 0.5m. Due to restricted working room, no more than two excavations will be open at any time. The concrete pours are typically approximately 16m³.
- 4.7.11 Major items of plant required to construct the foundations include a 20t excavator to excavate to formation and place the shoring system. Concrete is supplied via concrete wagon and placed by concrete skip with the excavator.

Piled Foundation

- 4.7.12 Piled foundations may be required at certain tower locations where ground conditions, groundwater constraints or structural loading requirements preclude the use of standard pad and column foundations. The construction methodology would typically involve the establishment of a temporary working platform, mobilisation of a piling rig and associated support plant, and installation of reinforced concrete piles to the required depth.

Rock Anchor

- 4.7.13 Anchors will be considered if suitable hard rock is encountered. If deeper foundations are necessary, pad and column foundations will be utilised. A similar working area would be required to that as set out within section 'Temporary Construction Compounds & Working Areas', however in this instance the area is excavated down to rockhead and an access ramp

formed with a nominal layer of stone placed to create a level working platform. The same major plant required for piled foundations are also required for rock anchor.

Tower Construction

- 4.7.14 Prior to the erection of each tower, a stone crane pad and laydown area will be created within the tower working area compounds to provide a stable working platform for lifting operations. Tower steelwork is transported to site by a flatbed wagon, and placed within the laydown area ready for assembly. Sections are then assembled on the ground before being lifted into position with a telehandler or an all-terrain mobile crane.
- 4.7.15 To allow for the proposed new overhead line tie-ins for the XL, ZCN and ZCS routes to tie into KINN, selected existing overhead line towers will be decommissioned, dismantled and removed, before new towers will be constructed. Further information on this is provided within the section 'Removal of Existing Towers', below.
- 4.7.16 Table 4-2 sets out the details of each new tower. These can also be viewed on Figure 4.2.

Table 4-2 New Terminal Towers

Route	New Tower Reference	NGR	Tower Type	Tower Structure Height
XL	XL004A	292549,689172	L8c DJT m3.7	44.6m
	XL004B	292536,689265	L8c DJT STD	48.3m
	XL004C	292466,689347	L6 ST STD	49.6m
	XL005A	292762,689434	L8c DJT STD	48.3m
ZCN	ZCN018A	292685,689567	L6 DJT STD	52m
	ZCN018B	292750,689677	L6 DT STD	50.6m
	ZCN019A	292542,689505	L6 DT STD	50.6m
	ZCN019B	292434,689628	L6 DJT STD	52m
ZCS	ZCS018A	292737,689515	L6 DJT STD	52m
	ZCS018B	292802,689622	L6 DT STD	50.6m
	ZCS019A	292494,689458	L6 DT STD	50.6m
	ZCS019B	292403,689563	L6 DJT STD	52m

Pulling Positions

- 4.7.17 Prior to the wiring operations, pulling positions will be established by an excavator. Pulling positions are located at the western sections of ZCN & ZCS adjacent to existing towers 22, and eastern sections adjacent to existing towers 16. Pulling positions for XL are situated adjacent to existing towers 3, 6, 7, 12 and 20. Pulling positions can be found on Figure 4.2.
- 4.7.18 Trackway panels will be installed by flatbed wagons and fixed into position. Winches and cable drums will then be deployed in readiness for pulling operation. Light pilot bond shall be pulled out along the section of line in preparation of wiring operations utilising a tracked machine. A puller / tensioner with ancillary equipment will then be used for pulling operations and a telehandler for mounting conductor drums.

Construction of Temporary Masts

- 4.7.19 Prior to the removal of the existing towers as shown on Figure 4.2, seven temporary masts will be installed to allow for continued safe operation of the lines while construction is undertaken. Temporary masts will be utilised to divert the circuits. Construction would involve the use of ground anchors and stays, no foundation works are necessary.
- 4.7.20 Table 4-3 below sets out the details of each temporary mast.

Table 4-3 Temporary Masts

Route	Temporary Mast Reference	NGR	Mast Type	Mast Structure Height	Mast Base (m ²)
XL	TT1	292657,689221	VS 400kV	39m	1.5
	TT2	292776,689339	VS 400kV	39m	1.5
	TT3	292923,689484	RA 400kV	36m	1.5
ZCN	TT1	292842,689726	VS 400kV	44m	1.5
	TT2	292564,689673	VS 400kV	44m	1.5
ZCS	TT1	292701,689576	VS 400kV	44m	1.5
	TT2	292500,689546	VS 400kV	44m	1.5

- 4.7.21 Once the new towers are constructed and the lines operational, the temporary masts would be removed and all land reinstated to its former condition.

Removal of Existing Towers

- 4.7.22 Following the construction of the temporary masts, the towers proposed to be removed would be dismantled. The locations of the towers to be removed are shown in Figure 4.2.
- 4.7.23 The removal process will involve a temporary working area. The steel towers to be removed with components re-used where practicable. Foundations will be removed to a minimum depth of approximately 1-1.5m below ground level with the area around the base of the tower cleared and the ground reinstated.
- 4.7.24 The proposed removal of existing towers will last approximately 3 months but over a staged basis and includes:
- Removal of conductors;
 - Removal of earthwire and associated fittings;
 - Dismantling of existing towers; and
 - Removal of foundations to a depth of approximately 1-1.5m.

- 4.7.25 Following removal of the towers, land will be reinstated which will take approximately 3-4 months.

Construction Access Arrangements and Site Management

Overview

- 4.7.26 As outlined above there are two proposed entry/exit points to the site. The primary point of access is via Hawkhill Road to the south of the Proposed Development ('the Hawkhill access

point'). This will be used for all construction access excluding abnormal loads and will also be the permanent access to the substation. A secondary access point ('the A876 access point') will be constructed and used for delivery and maintenance of abnormal loads (such as the transformers to be located within KINN, including their repair and replacement should it be required).

- 4.7.27 Access tracks are proposed to provide access to the towers along the XL route requiring reconductoring and to the new towers for the proposed new overhead line tie-ins to KINN including to the existing towers to be removed and to the temporary masts for the XL, ZCN and ZCS routes. Further information on access for the Overhead Line Works is set out within the sections below.
- 4.7.28 Access for the SPD Works within KINN would be taken from the Hawkhill access point. Access to the SPD Works to the east of KINN would via the existing road network (A977) and the single-lane track which provides access to the Poultry Farm.

The Hawkhill Road Access Point

- 4.7.29 The existing junction onto the C68, Hawkhill Road ('the Hawkhill access point') will be used for construction and permanent access. This is considered to be suitable for use with some upgrades. In order to limit the impact of construction traffic on Hawkhill Road, traffic management measures will be deployed. This will include widening of Hawkhill Road on its southern side and associated junction improvements as well as a temporary path to the north of the road to segregate pedestrians and cyclists from construction traffic. The access into the site via Hawkhill Road will be adopted as the permanent means of access and egress for staff accessing the Proposed Development during ordinary operation.

The A876 Access Point

- 4.7.30 An existing field access will be upgraded to enable access to the Proposed Development via a left turn-in from the A876. This will be for AILs only so will not be subject to intensive or extended use. Improvements to the existing track will be required including surfacing works, improvements to an existing culvert and installation of a new culvert and extension of the access track to the Proposed Development. While the A876 access is for abnormal indivisible loads only, it will be left in-situ in the event of emergency access or egress or for future maintenance (i.e. replacement of supergrid transformers (SGTs)).

Access to Overhead Line Works

XL Route Reconductoring

- 4.7.31 Should it be required, access to the towers along the XL route requiring reconductoring will be via a combination of existing field accesses along existing field boundaries and will require short sections of temporary track. Table 4-4 below sets out the proposed access arrangements to the towers along the XL route for reconductoring.

Table 4-4 Temporary Access to Terminal Towers for XL Route Reconductoring

Access to Tower	Type of Access	Additional Works Required for Access
XL12	Trackway	n/a
XL13	Trackway	n/a
XL14	Trackway	n/a
XL15	Trackway	Bog mats to be installed to mitigate gas crossing
XL16	Trackway	Bog mats to be installed to mitigate gas crossing
XL17	Trackway	n/a
XL18	Trackway	Culvert and double gate to be installed
XL19	Trackway	Culvert and double gate to be installed
XL20	Trackway	Small stone area at entrance to accommodate trackway. Existing gate left in situ.

- 4.7.32 As set out within the table above, all temporary tracks will be trackway. Trackways will be used to limit materials brought to site and ground disturbance. On completion of the construction works the trackway / bog mat will be removed and the original ground material reinstated.

Construction of the New Towers & Temporary Masts and Removal of Existing Towers

- 4.7.33 Access to the proposed new tower locations, existing towers to be removed and temporary masts for the XL, ZCN and ZCS routes is proposed to be via Hawkhill Road utilising the same access point as that proposed for KINN.
- 4.7.34 Temporary stone access road is proposed for all new towers and removal of existing towers. Trackway will be required for temporary mast construction and removal and for access to pulling positions including those to the east and west of KINN; located east of the A977 and west of the A876 respectively. This is shown on Figure 4.2.
- 4.7.35 A small section of permanent stone road is also proposed to spur off the north side of the new access proposed as part of the proposed KINN from the A876. This short section of access is circa 21 m in length and 3.5 m wide and will allow access for construction and removal of towers and will be retained to allow landowner access during operation.
- 4.7.36 Short sections of temporary access to remote working areas, such as pulling positions will be required to some locations, however access will primarily be taken via the existing road network and existing field accesses.

Site Management

- 4.7.37 All construction activities will be undertaken in accordance with a Construction Environmental Management Plan (CEMP), Construction Traffic Management Plan (CTMP) and Site Waste Management Plan (SWMP):
- The CEMP will set out good construction practice and environmental mitigation measures identified in this EIAR as well as roles and responsibilities for their implementation.

- The CTMP will set out construction traffic management details including details of access routes and access points to be utilised and details of abnormal load routes and access.
- The SWMP will set out the waste management measures to be followed on site for different waste streams in line with the waste hierarchy (reduce, reuse, recycle).

Temporary Construction Compounds & Working Areas

- 4.7.38 A main works construction compound is proposed within land southwest of and adjacent to KINN. This is shown on Figure 4.1. This compound will be used to provide office accommodation and welfare facilities for construction staff. This construction compound will provide a safe area for parking away from the public highways and the temporary storage of materials, plant and equipment. The compound will service works for all components of the Proposed Development.
- 4.7.39 In addition, at each proposed tower location for the Overhead Line Works a tower working area is proposed. This will be approximately 50m x 50m in area and will comprise a stone hardstanding construction and laydown area, turning head and segregated bunding area. This working area will be reduced to 30m x 30m at ZCN20, ZCS20, ZCN018, XL04, XL06 and for towers being removed, as well as for the temporary masts.

Construction Lighting

- 4.7.40 It is unlikely that construction lighting would be required during summer months. Should lighting be required (e.g. in the winter), it would be between the hours of 0700 – 0900 and 16:00 – 18:00 only, and to allow for safe access back to the public road network. These would either be mobile or fixed temporary lighting. Any lighting would be located and directed to avoid impacts to sensitive receptors.

Construction Programme and Hours of Working

Overview

- 4.7.41 Subject to relevant consents being in place, construction of the Proposed Development will commence in 2026. The overall construction programme is 4-5 years.
- 4.7.42 In general construction works will take place between 0700 - 1900 (Monday – Friday) and 0800 – 1700 (Saturday). No works are anticipated on Sundays or Bank Holidays, however, should this be required Fife and Clackmannanshire Councils would be notified in advance. Some works may be required outside of core working hours including:
- Works which need to be undertaken out of hours to minimise disruption to the local community such as delivery of supergrid transformers (SGTs) to KINN.
 - Start up and close down activities one hour either side of the core working hours to enable efficient mobilisation of construction activities.
 - The completion of operations commenced during the core working hours which cannot be stopped for safety or efficiency reasons, for example concrete pours.
 - Plant testing or commissioning; these are unlikely to involve high numbers of operatives or use of heavy plant or machinery.

Construction Phasing

4.7.43 While the components of the Proposed Development will be constructed separately there are interdependencies which some works will be undertaken sequentially and other works undertaken concurrently. In general

- Hawkhill Road Improvements, part of the KINN TCPA will be undertaken first
- Reconductoring of XL route can be undertaken independently of works at/around KINN
- Removal of 11kV wood pole overhead lines
- Installation of replacement 11kV underground cables
- Temporary diversion of XL/ZCN/ZCS routes as part of KINN site establishment
- KINN construction works civils/platform establishment
- Removal of existing towers on XL/ZCN/ZCS routes
- Construction of new towers on XL/ZCN/ZCS routes
- Installation of plant and equipment at KINN
- Connection of XL/ZCN/ZCS into KINN
- Commissioning and testing
- Removal of temporary masts
- Reinstatement and landscaping

4.7.44 Subject to gaining consent, Overhead Line Works construction would be expected to start in Q3 2027 and be functionally completed by the end of Q1 2029 to allow energisation. Works to construct the turn-ins to KINN would be expected to take approximately three years and start in Q1 2027 and be functionally completed by the end of Q4 2029. Certain advance works may take place in advance of the main construction periods. Subject to the receipt of the necessary consents, enabling and associated SPD works are anticipated to commence from Q1 2027. Overhead line construction activities are expected to begin from Q3 2027 and progress in a phased manner through to functional completion by the end of Q4 2029 to facilitate energisation of the proposed development.

Limits of Deviation (LoD)

4.7.45 Limits of Deviation are an area which defines the practical limits within which micro-siting of infrastructure can occur within the terms of the consent which is to be sought. The purpose of Limits of Deviation is to allow flexibility within a consent for the final micro-siting of individual components to respond to localised ground conditions, topography, engineering, and environmental constraints. The following sets out the LoD for the Proposed Development:

- Access tracks:
 - Upgrade to existing road / track: 20 m LoD either side of track;
 - New temporary stone road: 50 m LoD either side of track; and,
 - Trackway panels: 50 m LoD either side of track;

- Tower locations including related working areas 50 m LoD;
- Equi Potential Zones (EPZ) (also referred to as pulling positions): 25 m LOD;
- Temporary masts: 50 m LoD; and,
- A 6 m servitude strip will be applied to the Scottish Power Distribution Works.

4.7.46 Vertical LoDs are also being included to allow for the potential for a tower height increase of up to 3m on towers to ensure vertical safety clearances are achieved.

4.7.47 Implementation of the LoD would be controlled through the proposed detailed CEMP and Environmental Clerk of Works (ECoW). LoDs have been accounted for throughout this EIAR to ensure that a worst-case assessment has been undertaken.

4.8 Operation, Maintenance & Decommissioning of the Proposed Development

Operation and Maintenance

4.8.1 Following completion of commissioning, the Proposed Development will operate continuously throughout the year as part of the electricity transmission and distribution system. During ordinary operation the substation will be unmanned as it will be operated remotely. Mandatory inspection and maintenance will take place regularly during its lifetime. Staff numbers carrying out planned inspection and maintenance will vary from individuals to small teams undertaking inspections or routine maintenance, however, should more extensive unplanned works be required this would involve more staff.

4.8.2 The Overhead Line Works will require minimal maintenance. The condition of tower steelwork and foundations will be monitored regularly. Towers which have deteriorated significantly may be dismantled carefully and replaced. Any vegetation within proximity to the new proposed new overhead line tie-ins will also be monitored to ensure it does not impact on safety clearances.

Permanent Access Arrangements

4.8.3 During operation access to the Proposed Development will be via Hawkhill Road to the south of the site and following the proposed internal road to the substation compound. In the event of major maintenance works, for example the replacement of a SGT, temporary access via the A876 would require to be established connecting to the road left in-situ within the site. In such an instance, traffic management measures and any other temporary works would be agreed with Transport Scotland and Fife and Clackmannanshire Councils.

Decommissioning

4.8.4 It is not envisaged that the Proposed Development would be decommissioned, it is proposed as permanent development, which will exist on an enduring basis as part of the transmission grid network, therefore no decommissioning is proposed. The lifespan of the equipment is approximately 40 years, however, it is expected that this would be extended through replacement or refurbishment.

- 4.8.5 In the event that the Proposed Development was no longer required and could be decommissioned then a Decommissioning Plan would be prepared and planning permission would be obtained, if required, in accordance with the relevant legislation in place at the time. The substation equipment, towers and materials would be removed and taken for recycling where practicable. It is expected that the platform, access roads and foundations would be removed (the latter to approximately 1-1.5m deep). and land reinstated. The process of decommissioning would be similar to construction meaning the likely significant environmental effects would be comparable. As a result, decommissioning has not been assessed in the EIAR.

4.9 Design Compliance with UK Code of Practice on EMF

- 4.9.1 All equipment that generates, distributes or uses electricity produces electric and magnetic fields (EMFs). Health protection guidelines exist for both public and occupational exposure to time-varying electric, magnetic and electromagnetic fields with a frequency of up to 300GHz. Exposure limits for EMFs in the UK are set by the Government on advice from public health bodies. The exposure limits for EMFs are derived from the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines, published in 1994 and 1998 respectively and recently updated in March 2020 (Appendix 4.2).
- 4.9.2 Electricity transmission substations, such as KINN, do not produce very large electric fields themselves (generally less than a microtesla). Electric fields depend on the operating voltage of the equipment producing them. They are shielded by most common building materials, trees and fences, and diminish rapidly with distance from the source. Substations do produce a magnetic field. Magnetic fields depend on the electrical currents flowing, which vary according to the electrical power requirements at any given time. Magnetic fields are not significantly shielded by most common building materials or trees but do diminish rapidly with distance from the source. At approximately 1-2m from the substation, magnetic fields are typically lower than those found in a residential property.
- 4.9.3 Overhead lines such as the Overhead Line Works produce electric fields (produced by voltage) and magnetic fields (produced by the current flowing through a conductor or wires). Technical Information relating to EMFs generated by the Overhead Line Works is contained in Appendix 4.3. This demonstrates that the Overhead Line Works are fully compliant with the current public exposure guidelines for EMFs.
- 4.9.4 Therefore, it is considered that no element of the Proposed Development would give rise to any significant effects resulting from EMF-related impacts. Effects arising from EMF have therefore been scoped out of this EIAR.

5 Planning Policy Context

5.1 Introduction

- 5.1.1 This chapter summarises planning policy which is considered to be relevant to the Proposed Development. This includes policies pertaining to climate and energy which provide background to and establish the need for the Proposed Development as well as relevant Development Plan policies which would be considered as part of the determination of the planning application.

5.2 Climate Change and Energy Policy Context

Climate Change Plan 2018-2032 (2020 update)

- 5.2.1 The Climate Change Plan 2018 – 2032 (Ref 5-1) is the Scottish Government’s plan for meeting the Scottish Government’s greenhouse gas emission reduction targets to 2032. The Scottish Government declared a state of climate emergency in April 2019 and in doing so placed climate change at the centre of all policy decisions. As a result, amendments were made to the Climate Change (Scotland) Act 2009 through the Climate Change (Emissions Reduction Targets (Scotland)) Act 2019 to create a legally binding target for net Scottish emissions to reach net zero by 2045, and an interim target of reducing emissions by 75% by 2030. To reflect the legislative changes, in December 2020, the Scottish Government produced the Update to the Climate Change Plan (CCP) 2018 – 2032: Securing a Green Recovery on a Path to Net Zero.
- 5.2.2 It should be noted that the interim targets were repealed by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024, after it was accepted that the 2030 interim target could not be met, and has been replaced by a framework for a carbon budget-based approach for setting emissions reduction targets. The Climate Change Plan has not yet been updated to address these changes. The target to be net zero by 2045 remains legally binding.
- 5.2.3 The Climate Change Plan sets out a strategy for reducing greenhouse gas emissions across all sectors. With regard to electricity, the Plan reaffirms the Scottish Government’s commitment to the rapid increase of renewable energy. The Plan expresses the need for Scotland to continue to export large amounts of clean electricity and to maintain its position as a net exporter of electricity. For this to be realised, reinforcements of the electricity transmission system, such as the Proposed Development are critical.

Offshore Wind Policy Statement (2020)

- 5.2.4 The Scottish Government’s Offshore Wind Policy Statement (Ref 5-2) was published in 2020. It identifies a target of up to 11 GW of installed offshore wind capacity in Scottish Waters by 2030. The scale of the offshore wind development in Scottish Waters is reflected in the most recent seabed leasing rounds, ScotWind (2022) and INTOG (2023) overseen by Crown Estate Scotland (CES), with approximately 30GW of offshore wind capacity in development. More

recently in early 2026 the Scottish Government published an update to the Offshore Wind Policy Statement with a revised target of up to 40 GW of new offshore wind capacity by 2040.

Onshore Wind Policy Statement (2022)

- 5.2.5 The Scottish Government's Onshore Wind Policy Statement (Ref **5-3**) was published in 2022. It sets out a target to achieve a minimum of 20GW of installed capacity of onshore wind in Scotland by 2030. The Policy Statement notes that delivering 20GW targets will require investment in electricity networks with new infrastructure required to be delivered at pace. The 20GW target was most recently reaffirmed in late 2023 with the publication of the Onshore Wind Sector Deal (Ref **5-4**) which sets out commitments from the Scottish Government and the onshore wind industry to deliver on the 2030 target.

Draft Energy Strategy and Just Transition Plan (2023)

- 5.2.6 The Draft Energy Strategy and Just Transition Plan (2023) (Ref **5-5**) sets out the Scottish Government's policies and commitments in relation to energy production and use as well as how to ensure those works and communities whose livelihoods are bound up with the current energy system will not be left behind as the sector changes in response to net zero. The Plan also reconfirms the targets set out in the Onshore Wind and Offshore Wind Policy Statements and identifies the need for significant investment in the electricity transmission system to meet 2030 targets.

Green Industrial Strategy (2024)

- 5.2.7 The purpose of the Green Industrial Strategy (Ref **5-6**) is to ensure that Scotland realises the maximum possible economic benefits from opportunities created by the transition to net zero. It reaffirms the Onshore Wind Policy Statement targets highlighting a commitment to deliver at least 20GW of onshore wind by 2030. With regard to offshore wind, it notes that Scotland currently has a potential pipeline of over 40GW. The Strategy also makes a number of commitments in relation to onshore electricity networks including aiming to accelerate consenting timescales for electricity transmission developments in order to support more rapid expansion of new network infrastructure.

Clean Power 2030 Action Plan (2024)

- 5.2.8 The Clean Power 2030 Action Plan (Ref **5-7**) sets out how the United Kingdom will achieve clean power by 2030 addressing three major challenges: the need for a secure and affordable energy supply, the creation of essential new industries and the need to reduce greenhouse gas emissions and limit the country's contribution to climate change. The Plan recognises the need for the electricity network to undergo unprecedented expansion in order to connect new generation and meet future demand as the economy electrifies.
- 5.2.9 The Clean Power 2030 Action Plan establishes the pathway for achieving a secure, affordable and low carbon electricity system by 2030. This objective is supported by a wider suite of UK Government and regulatory policy, including the British Energy Security Strategy and the Electricity Networks Strategic Framework, which recognise that maintaining energy security

and enabling economic growth require a substantial and accelerated expansion of the electricity transmission network to connect new generation and meet increasing demand. The National Policy Statement for Electricity Networks Infrastructure (EN-5) further identifies new network infrastructure as a critical national priority, emphasising that the security and reliability of the UK's future energy system is dependent on the timely delivery of electricity network reinforcements. In this context, NESO analysis and strategic planning documents highlight the need for coordinated investment in transmission infrastructure to support electrification and ensure a resilient and secure energy system.

Overarching National Policy Statement for Energy (EN-1) (2025)

- 5.2.10 National Policy Statement (NPS) EN-1 sets out the UK Government's overarching policy with regard to the development of energy infrastructure, however, paragraph 1.4.2 makes clear that energy policy is generally a matter reserved to UK Ministers and therefore the NPS may be a relevant consideration in planning decisions in Scotland.
- 5.2.11 EN-1 emphasises the need for new energy infrastructure in order to deliver Clean Power by 2030 and net zero by 2050. This includes new electricity network infrastructure with paragraph 2.1.2 stating *"To produce the energy required for the UK and ensure it can be transported to where it is needed, a significant amount of infrastructure is needed at both local and national scale"* and paragraph 3.3.7 stating *"Electricity networks are needed to connect the output of other types of electricity infrastructure with consumers and each other"*. At paragraph 3.3.62 EN-1 also establishes *"that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure"* with paragraph 4.2.17 confirming that this includes electricity grid infrastructure *"including network reinforcement and upgrade works, and associated infrastructure such as substations"*.

National Policy Statement for Electricity Networks Infrastructure (EN-5) (2025)

- 5.2.12 NPS EN-5 relates specifically to electricity networks. As with EN-1, it makes clear that EN-5 may be relevant to planning decisions in Scotland with paragraph 1.4.3 also noting it may be particularly relevant *"given the increase in Scotland to England onshore and offshore network connections required to meet the government's net zero target."*
- 5.2.13 EN-5 reaffirms the need for nationally significant low carbon infrastructure and that electricity grid infrastructure falling within the scope of EN-5 *including network reinforcement and upgrade works, and associated infrastructure such as substations"* are a critical national priority (CNP). Paragraph 1.1.6 sets out *"as all new grid projects will contribute towards greater efficiency in constructing, operating and connecting low carbon infrastructure to the National Electricity Transmission System. These are viewed by the government as being CNP infrastructure and should be progressed as quickly as possible."*

5.3 The Development Plan

Overview

5.3.1 The Development Plan comprises the National Planning Framework (NPF) and the Local Development Plan (LDP) for the area. Therefore, the Development Plan for the Proposed Development comprises NPF4 (Ref **5-8**) as well as the LDPs for Fife Council and Clackmannanshire Council; the Fife LDP (adopted 2017) (Ref **5-9**), and the Clackmannanshire LDP (adopted 2015) (Ref **5-10**). In summary:

- KINN – the majority of KINN including the Hawkhill Road Improvements are located within Fife with a small section related to the access connecting to the A876 located in Clackmannanshire.
- Overhead Line Works – the reconductoring of XL route is mainly located within Clackmannanshire. The new towers required to connect XL, ZCN and ZCS to KINN are located within Fife but some temporary working areas extend into Clackmannanshire.
- SPD Works – the SPD Works extend across Clackmannanshire and Fife. Works to the north of Canal Burn are within Clackmannanshire, however, to the south works are within the KINN site within Fife.

National Planning Framework

5.3.2 NPF4 sets out how the Scottish Government’s approach to planning and development will help to achieve a net zero, sustainable Scotland by 2045. It also identifies eighteen National Developments which are developments of national importance that will help deliver the spatial strategy. Any development which has been given a National Development status is considered to be acceptable in principle. This includes ‘Strategic Renewable Electricity Generation and Transmission Infrastructure’. This is outlined in Section 3 of Annex B, which states that this national development supports renewable electricity generation, repowering, and expansion of the electricity grid.

5.3.3 Development contributing to the delivery of ‘Strategic Renewable Electricity Generation and Transmission Infrastructure’, is classed as a ‘National Development’ in NPF4, if it is of a scale or type that would otherwise have been classed as ‘major’ by ‘The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009’ (HoD Regulations), and it falls within one or more of the Classes of Development specified in NPF4. The Classes of Development include: *“New and/or upgraded infrastructure directly supporting on and offshore high voltage electricity lines, cables and interconnectors including converter stations, switching stations and substations.”* for KINN, and for the Overhead Line Works: *“New and/or replacement upgraded on and offshore high voltage electricity transmission lines, cables and interconnectors of 132kv or more.”*

5.3.4 The HoD Regulations provide that various classes of development should be categorised as major development, including development where the area of the site is or exceeds 2 hectares. The application site for KINN is greater than 2 hectares and the Overhead Line Works would also exceed 2 hectares. Therefore, the Proposed Development comprises new and upgraded electricity transmission network infrastructure supporting increased renewable energy

generation, and would otherwise have been classified as major development, it is classed as ‘National Development’, as it would assist in the delivery of the Spatial Strategy for Scotland.

- 5.3.5 NPF4 must be read as a whole, and its 33 policies are to be used as a guide to decision making. Where there is a conflict between NPF4 and the LDP policy, NPF4 takes precedence given that it is the more recently adopted Plan. Table 5-1 summarises relevant NPF4 policies and related EIA topics.

Table 5-1 Relevant NPF4 Policies

NPF4 Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 1: Tackling the climate and nature crises	Policy 1 gives significant weight to the climate emergency and nature crisis in order to ensure that these are recognised as priorities in all plans and decisions taken regarding new development.	- Ecology (Ch06) - Other Environment Aspects (Ch13)
Policy 2: Climate mitigation and adaptation	Policy 2 is intended to encourage, promote and facilitate development that minimises emissions which would otherwise contribute to climate change as well as development which adapts to current and future impacts arising from climate change.	- Other Environment Aspects (Ch13) - Water Environment (Ch09) - Flood Risk Assessment (standalone)
Policy 3: Biodiversity	Policy 3 protects biodiversity and requires proposals for national or major development to conserve, enhance and restore biodiversity.	Ecology (Ch06)
Policy 4: Natural Places	Policy 4 protects internationally, nationally, regionally and locally important nature assets such as sites designated for landscape or ecological purposes as well as protected habitats and species.	- Ecology (Ch06) - Landscape and Visual (Ch07)
Policy 5: Soils	Policy 5 provides protection to carbon-rich soils and peatlands as well as prime agricultural land.	- Ground Conditions (Ch10) - Ground Investigation (standalone)
Policy 6: Forestry, Woodland, and Trees	Policy 6 provides protection to trees and woodland encouraging the retention and expansion of both.	Other Environment Aspects (Ch13)
Policy 7: Historic Assets and Places	Policy 7 protects historic environment assets and requires development proposals with the potential to significantly impact them to be accompanied by an assessment considering their cultural significance.	Cultural Heritage and Archaeology (Ch08)

NPF4 Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 11: Energy	Policy 11 is intended to encourage, promote and facilitate all forms renewable energy development including new and replacement electricity transmission infrastructure. It also sets out a range of impacts which must be considered in the design of proposals including on a range of environmental aspects.	All chapters (Ch06-13)
Policy 13: Sustainable Transport	Policy 13 is intended to encourage, promote and facilitate developments which encourage sustainable forms of transport. It advises that development proposals will be supported where they demonstrate that transport requirements have considered sustainable travel and investment hierarchies.	- Description of the Proposed Development (Ch04) - Traffic & Transport (Ch11)
Policy 14: Design, Quality and Place	Policy 14 promotes quality in design and advises that development proposals will be supported where they are consistent with six qualities of successful places (healthy, pleasant, connected, distinctive, sustainable and adaptable).	- Description of the Proposed Development (Ch04) - Landscape and Visual (Ch07) - Design and Access Statement (standalone)
Policy 22: Flood Risk and Water Management	Policy 22 seeks to ensure that flood risk is not exacerbated by development proposals, and facilitates the delivery of sustainable flood risk management solutions. It sets out conditions which must be satisfied in instances where development proposals are at risk of flooding or located within a flood risk area.	- Water Environment (Ch09) - Flood Risk Assessment (separate)
Policy 23 Health and Safety	Policy 23 seeks to protect people and places from environmental harm and mitigate risks that could arise from safety hazards. It sets out a number of factors to be considered including in relation to air quality and noise.	- Construction and Operational Noise (Ch12) - Other Environment Aspects (Ch13)

Clackmannanshire Local Development Plan

- 5.3.6 The relevant LDP for the Proposed Development within Clackmannanshire is the Clackmannanshire LDP (Ref 3.4) adopted in August 2015. The LDP sets out strategic objectives and planning policies to guide development within Clackmannanshire and is

supported by Supplementary Guidance (SG). Table 5.3 summarises relevant Clackmannanshire LDP policies and related EIA topics.

Table 5-2 Relevant Clackmannanshire LDP Policies

Clacks LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
SC11 Transport Networks	This policy aims to ensure the impacts of development on the wider transport network are considered and that opportunities to enhance the network are identified. This includes safeguarding and enhancing the Core Path network as appropriate.	Traffic and Transport (Ch 11)
SC12 Development Proposals - Access and Transport Requirements	This policy aims to ensure sustainable transport infrastructure is integrated in the design of new transport proposals and sets out requirements for new development proposals.	- Description of the Proposed Development (Ch04) - Traffic and Transport (Ch 11)
SC14 Renewable Energy	This policy aims to encourage the use of renewable energy and sets out that renewable or low carbon energy generation including associated transmission infrastructure will normally be supported where a range of criteria, including its impacts, are appropriately addressed.	All Chapters (Ch06-13)
SC20 Water and Drainage Infrastructure and Capacity	This policy aims to ensure that developments are served by required standards of water and drainage infrastructure including requiring an appropriate SUDS system	- Description of the Proposed Development (Ch04) - Water Environment (Ch09)
SC23 Development in the Countryside - General Principles	This policy aims to safeguard the countryside from inappropriate development and sets out criteria that should be satisfied for development within the countryside.	- Site Selection and Alternatives (Ch03) - Ecology (Ch06) - Landscape and Visual Amenity (Ch07)
EP3 Business and Industrial Uses Outwith Existing or Allocated Business Sites	This policy sets out criteria in relation to business and industrial proposals outside of allocated sites identified within the LDP.	Landscape and Visual Amenity (Ch07)

Clacks LDP Policy Policy Summary		Relevant EIA Topics/Other Application Documents
		- Construction and Operational Noise (Ch12) - Other Environmental Aspects (Ch13)
EA1 Clackmannanshire Green Network	This policy supports the implementation of Central Scotland Green Infrastructure requiring new development to contribute to Green Network principles where possible.	Ecology (Ch06)
EA2 Habitat Networks and Biodiversity	This policy encourages the protection and enhancement of biodiversity and habitat networks by safeguarding the integrity of features of the landscape which are important because of their linear and continuous structure or function as intermediate sites for the movement of both fauna and flora.	Ecology (Ch06)
EA3 Protection of Designated Sites and Protected Species	This policy aims to protect designated sites and protected species. Where a development proposal could have a detrimental impact on a protected species or a likely significant effect on designated sites requires an assessment to be undertaken.	Ecology (Ch06)
EA4 Landscape Quality	This policy aims to protect and enhance the quality and distinctive character of Clackmannanshire's landscape and Special Landscape Areas.	Landscape and Visual Amenity (Ch07)
EA7 Hedgerows, Trees and Tree Preservation Orders	This policy aims to retain trees, woodland and hedgerows that make a positive contribution to local amenity and notes that where development results in the loss of existing woodland, trees or hedgerows that replacement planting will be required.	- Ecology (Ch06) - Landscape and Visual Amenity (Ch07)
EA9 Managing Flood Risk	This policy aims manage the risk of flooding from all sources: river, coastal, surface water, sewers, groundwater, reservoirs and other infrastructure and sets out a general presumption against proposals for development or land raising on a functional flood plain and in areas where there is a significant flooding probability from any source, or where the proposal would increase the probability of flooding elsewhere.	- Water Environment (Ch09) - Flood Risk Assessment (standalone)
EA11 - Environmental Quality	This policy seeks to protect the quality of the environment and where development has the potential to affect the development, for example	Description of the Proposed

Clacks LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
	through noise, light, soil, water or air impacts requires all reasonable measures to mitigate such impacts to be taken.	- Development (Ch04) - Construction and Operational Noise (Ch12)
EA12 Water Environment	This policy aims to protect and enhance the water environment.	Water Environment (Ch09)
EA13 Significant Soil Resources	This policy aims to protect the areas of prime agricultural land and carbon rich soils from inappropriate development and sets out criteria that should be addressed where such development is proposed in such areas.	Ground Conditions (Ch10)
EA19 Scheduled Monuments	This policy aims to protect Scheduled Monuments and other identified nationally important archaeological resources.	Cultural Heritage (Ch08)
EA20 Other Archaeological Resources	This policy aims to protect other archaeological resources and preserve them in situ wherever possible.	Cultural Heritage (Ch08)
EA22 Listed Buildings	This policy aims to protect listed buildings and their settings.	Cultural Heritage (Ch08)

Fife Local Development Plan

5.3.7 The relevant LDP for the Proposed Development within Fife is FIFEplan (Ref 3.6) which was adopted in September 2017. FIFEplan sets out the planning strategy and policies to guide development within Fife and is supported by Supplementary Guidance (SG). Table 5-3 summarises relevant FIFEplan policies and related EIA topics.

Table 5-3 Relevant FIFEplan Policies

Fife LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 1: Development Principles	This policy sets out three Parts (A-C) which define criteria that should be addressed or satisfied: Part A with regard to the location of development, Part B with regard to development impact and Part C with regard to supporting information or assessments.	- Site Selection and Alternatives (Ch03) - Description of the Proposed Development (Ch04)

Fife LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 3: Infrastructure and Services	The policy requires that the development be designed and implemented to provide the necessary infrastructure and operate sustainably.	- Description of the Proposed Development (Ch04) - Traffic and Transport (Ch11)
Policy 7 Development in the Countryside	This policy aims to safeguard the countryside from inappropriate development and sets out criteria that must be addressed for proposals in countryside locations.	- Site Selection and Alternatives (Ch03) - Landscape and Visual Amenity (Ch07)
Policy 10 Amenity	Policy 10 states that development will only be supported if it does not have a significant detrimental impact on the amenity of existing or proposed land uses. Development proposals must demonstrate that they will not lead to a significant detrimental impact on amenity including on air quality, land contamination, nuisance (e.g. noise and light), traffic, visual amenity and on adjacent land uses.	- Landscape and Visual Amenity (Ch07) - Traffic and Transport (Ch11) - Construction and Operational Noise (Ch12) - Other Environmental Aspects (Ch13)
Policy 11 Low Carbon Fife	Policy 11 states that planning permission will only be granted for new development where certain criteria are met including in relation to materials, flood risk, drainage and transport.	All Chapters (Ch06-13)
Policy 12 Flooding and the Water Environment	Policy 12 sets out that development will only be supported where they can demonstrate that certain factors can be met including that they do not increase flooding or flood risk at the site or elsewhere, affect storage capacity on the functional floodplain or detrimentally impact on the ecological quality of the water environment.	- Description of the Proposed Development (Ch04) - Water Environment (Ch09) - Flood Risk Assessment (standalone) - Surface Water Management Plan (Standalone)

Fife LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 13 Natural Environment and Access	Policy 13 states that development proposals will only be supported where they protect or enhance natural heritage and access assets including sites designated for landscape or ecological reasons, woodlands, protected species and habitats, landscape character, carbon-rich soils and Core Paths and other recreational routes.	- Ecology (Ch06) - Landscape and Visual Amenity (Ch07) - Other Environmental Aspects (Ch13)
Policy 14 Built and Historic Environment	Policy 14 states that development which protects or enhances buildings or other built heritage of special architectural or historic interest will be supported. Proposals will not be supported where it is considered that they will harm or damage historic environment assets.	Cultural Heritage (Ch08)

5.4 References

- Ref 5-1 Climate Change Plan (2020), Scottish Government
<https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/>
- Ref 5-2 Offshore Wind Policy Statement (2020), Scottish Government
<https://www.gov.scot/publications/offshore-wind-policy-statement/>
- Ref 5-3 Onshore Wind Policy Statement (2022), Scottish Government
<https://www.gov.scot/publications/onshore-wind-policy-statement-2022/>
- Ref 5-4 Onshore Wind Sector Deal (2023), Scottish Government
<https://www.gov.scot/publications/onshore-wind-sector-deal-scotland/>
- Ref 5-5 Draft Energy Strategy Just Transition Plan (2023), Scottish Government
<https://www.gov.scot/publications/draft-energy-strategy-transition-plan/>
- Ref 5-6 Green Industrial Strategy (2024), Scottish Government
<https://www.gov.scot/publications/green-industrial-strategy/documents/>
- Ref 5-7 Clean Power 2030 Action Plan (2024) UK Government
<https://www.gov.uk/government/publications/clean-power-2030-action-plan>
- Ref 5-8 National Planning Framework 4 (2023), Scottish Government
<https://www.gov.scot/publications/national-planning-framework-4/documents/>
- Ref 5-9 FIFEPlan Local Development Plan 2 (2017), Fife Council, <https://fife-consult.objective.co.uk/kse/event/30240/section/4395822>
- Ref 5-10 Clackmannanshire Local Development Plan (2015) Clackmannanshire Council,
<https://www.clacks.gov.uk/property/ldpadopted/>