



Fosse Green Energy

Preliminary Environmental Information Report

VOLUME

1

**Chapter 4: Alternatives and Design
Evolution**

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4. Alternatives and Design Evolution

4.1 Introduction

- 4.1.1 This chapter of the Preliminary Environmental Information (PEI) Report describes the consideration of alternatives and design evolution in relation to the Proposed Development.
- 4.1.2 In accordance with Paragraph 2 of Schedule 4 of the EIA Regulations (Ref 4-1), the Environmental Statement (ES) that will be submitted with the Development Consent Order (DCO) Application will include: *“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.”*
- 4.1.3 Regulation 14(2)(d) of the EIA Regulations (Ref 4-1) identifies the requirement to present alternatives where these have been considered by the Applicant. It states that the ES should include: *“A description of the reasonable alternatives studied by the applicant, which are relevant to the proposed 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.”*
- 4.1.4 Whilst there is no general requirement in relevant national policy to consider alternatives, the National Policy Statements on energy infrastructure provide some useful context. Overarching National Policy Statement (NPS) for Energy EN-1 (Ref 4-2) paragraph 4.3.9 states that *“As in any planning case, the relevance or otherwise to the decision-making process of the existence (or alleged existence) of alternatives to a proposed development is in the first instance a matter of law. This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option from a policy perspective.* The same paragraph goes on to explain that *“Although there are specific requirements in relation to compulsory acquisition and habitats sites, the NPS does not change requirements in relation to compulsory acquisition and habitats sites.”* Regarding compulsory acquisition, the Applicant has sought to enter into voluntary agreements with landowners at an early stage, with a view to reducing the need to rely upon compulsory acquisition powers in the DCO.
- 4.1.5 Paragraph 4.3.16 of NPS EN-1 (Ref 4-2) states that the NPSs may impose a policy requirement to consider alternatives. These include biodiversity and geological conservation interests, flood risk and development within nationally designated landscapes. Sections 5.4, 5.8, and 5.10 of NPS EN-1 (Ref 4-2) explain these policy requirements. Paragraph 4.3.17 of NPS EN-1 (Ref 4-2) states *“where there is a policy or legal requirement to consider*

alternatives the applicant should describe the alternatives considered in compliance with these requirements.”

- 4.1.6 Paragraph 4.3.22 of NPS EN-1 (Ref 4-2) states that *“Given the level and urgency of need for new energy infrastructure, the Secretary of State should, subject to any relevant legal requirements (e.g. under the Habitats Regulations) which indicate otherwise, be guided by the following principles when deciding what weight should be given to alternatives:*
- a. The consideration of alternatives in order to comply with policy requirements should be carried out in a proportionate manner; and*
 - b. Only alternatives that can meet the objectives of the proposed development need to be considered.”*
- 4.1.7 Paragraph 4.3.24 of NPS EN-1 (Ref 4-2) refers to site selection alternatives, stating: *“The Secretary of State should not refuse an application for development on one site simply because fewer adverse impacts would result from developing similar infrastructure on another suitable site, and it should have regard as appropriate to the possibility that all suitable sites for energy infrastructure of the type proposed may be needed for future proposals.”*
- 4.1.8 At this preliminary stage, it is not anticipated that the Proposed Development will cause significant harm to biodiversity and geological conservation interests or nationally designated landscapes. The alternatives analysis to be presented in the ES will focus on different layouts, sizing, technologies and design parameters, and site location considered in the design process of the Proposed Development.
- 4.1.9 Consideration of ‘no development’ as an alternative to the Proposed Development has not been considered further. This is because ‘no development’ is not considered to be a reasonable alternative to the Proposed Development as it would not deliver the renewable electricity generation capacity or storage proposed. Paragraph 4.3.27 of NPS EN-1 (Ref 4-2) states *“Alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant to the Secretary of State’s decision.”*
- 4.1.10 Other generation schemes, such as wind power, nuclear, coal, or gas fired power stations, have not been assessed due to their unsuitability to the Site (in the case of a large-scale wind project and nuclear energy) or their inability to contribute to the UK’s need for low carbon electricity (in the case of coal or gas).
- 4.1.11 A ‘smaller development’ as an alternative to the Proposed Development has also not been considered further as Paragraph 4.3.23 of NPS EN-1 (Ref 4-2) states the decision maker *“...should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security and climate change benefits) in the same timescale as the proposed development.”*

- 4.1.12 Paragraph 5.10.26 of NPS EN-1 (Ref 4-2) provides that *“Reducing the scale of a project can help to mitigate the visual and landscape effects of a proposed project”* but goes to recognise that *“However, reducing the scale or otherwise amending the design of a proposed energy infrastructure project may result in a significant operational constraint and reduction in function – for example, electricity generation output”*. A smaller scheme would not deliver the same generation capacity or energy security and climate change benefit as the Proposed Development and, as such, would not represent a reasonable alternative.

4.2 Need for the Proposed Development

- 4.2.1 NPS EN-1 (Ref 4-2) confirms at paragraph 4.2.5 that *“there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure.”* This sets out a policy presumption in favour of CNP infrastructure, such as solar, to achieve energy objectives to decarbonise the energy sector by 2035 and to achieve net zero by 2050.
- 4.2.2 The Proposed Development’s principal objective is to generate low-carbon electricity for an operational period of 60 years, to meet the UK’s urgent need for low carbon electricity. The inclusion of electricity storage assets as ‘associated infrastructure’ to the principal solar development provides a means of further enhancing and stabilising the utility of the power generated by the Proposed Development by providing energy balancing capabilities and other services to support the decarbonisation and operation of the National Electricity Transmission System.

Global commitment to decarbonisation

- 4.2.3 On 20 March 2023, the U.N. Intergovernmental Panel on Climate Change published its 2023 assessment of global climate change (Ref 4-3). The advisory report concludes that within the next 10 years the world is likely to pass a dangerous temperature threshold, pushing the planet past the point of catastrophic warming – unless nations drastically transform their economies and immediately transition away from fossil fuels.
- 4.2.4 The most recent Conference of the Parties (COP) 28 held in Dubai between the 30 November and 12 December 2023 signalled a further increase in the urgency of global action required to fight climate change. COP28 marked the beginning of the end of fossil fuels, therefore also marking the absolute requirement to generate energy from low-carbon sources. The COP28 agreement also stated that all countries must take action now to curb emissions – not in a distant future. This is a key point, since all countries including the UK committed to update their national climate plans for COP29 and therefore must now increase their carbon reduction ambitions (Ref 4-6).

UK commitments to decarbonisation and net zero

- 4.2.5 The urgent need for new energy generation infrastructure, particularly from renewable sources such as solar, is highlighted in the growing body of UK energy and climate change international commitments, law, policy and

guidance. Alongside this drive for new energy generation the UK Government has committed to achieving net zero greenhouse gas emissions by 2050 and to decarbonisation of the energy sector by 2035.

- 4.2.6 Decarbonisation is a legal requirement in the UK and is of global significance. In June 2019, the Government passed a law to end the UK's contribution to global warming by 2050 by enacting the Climate Change Act 2008 (2050 Target Amendment) Order 2019 (Ref 4-4). The Climate Change Act 2008 (Ref 4-5) requires the UK Government to set carbon budgets which set the trajectory for decarbonisation actions required to meet this commitment. The carbon budgets recognise that atmospheric carbon has a cumulative global heating effect and therefore urgent action is necessary. The Sixth Carbon Budget (written into law in June 2021) runs from 2033 to 2037 and requires a 78% reduction in UK territorial emissions between 1990 and 2035.
- 4.2.7 Decarbonisation requires the electrification of energy which is currently sourced from fossil fuels (including gas, petrol and diesel). To meet the Government's decarbonisation objectives, extensive electrification will require support from a major expansion of renewable and other low-carbon power generation to ensure that the UK is capable of securely meeting future electricity demand, and with a significantly lower carbon intensity. The decarbonisation of UK electricity generation is therefore vitally important to meet the UK's legal obligations on carbon emissions and ensure sustainable energy resilience in accordance with the British Energy Security Strategy (Ref 4-9).
- 4.2.8 In December 2020, the UK Government communicated its Nationally Determined Contributions (NDCs) to reduce greenhouse gas (GHG) emissions by at least 68 per cent from 1990 levels by 2030. The UK Government's objectives for the energy system are to ensure that supply of energy always remains secure, reliable, affordable, and consistent with meeting the target to cut GHG emissions to net zero by 2050, including through delivery of UK carbon budgets and NDC.
- 4.2.9 While there is a clear commitment to decarbonisation and net zero, the Committee on Climate Change (CCC) has outlined concerns in its most recent Progress Report to the UK Government that current efforts will not meet the goals committed to: *"The UK has committed to reduce emissions in 2030 by 68% compared to 1990 levels, as its Nationally Determined Contribution to the Paris Agreement. It is the first UK target set in line with Net Zero. Now only six years away, the country is not on track to hit this target despite a significant reduction in emissions in 2023. ... Our assessment is that only a third of the emissions reductions required to achieve the 2030 target are currently covered by credible plans. Action is needed across all sectors of the economy, with low-carbon technologies becoming the norm"* (Ref 4-7).

Policy Promotion of Renewable Energy Development

- 4.2.10 Government policy set out in the Energy White Paper (December 2020), the Net Zero Strategy (October 2021), the British Energy Security Strategy (September 2022) and Powering up Britain (March 2023) sets out the foundations to transform the energy sector, tackle emissions while also ensuring a secure and reliable supply, achieve affordable bills for households and businesses and deliver net zero commitments. In order to achieve these ambitions, the Government is promoting a range of technologies including renewables, nuclear, hydrogen and carbon capture and storage. This is reflected in paragraph 2.5.6 of the NPS EN-1 (Ref 4-2) which also recognises that to achieve energy security, and address the UK's vulnerability to international energy prices and improving energy efficiency, it is important to accelerate the *“deployment of renewables, nuclear, hydrogen, CCUS, and related network infrastructure, so as to ensure a domestic supply of clean, affordable, and secure power as we transition to net zero”*.

The Need for New Electricity Infrastructure

- 4.2.11 NPS EN-1 (Ref 4-2) sets out the need for new, nationally significant electricity infrastructure stating at paragraph 3.3.1 that *“Electricity meets a significant proportion of our overall energy needs and our reliance on it will increase as we transition our energy system to deliver our net zero target. We need to ensure that there is sufficient electricity to always meet demand; with a margin to accommodate unexpectedly high demand and to mitigate risks such as unexpected plant closures and extreme weather events.”* Several types of infrastructure are needed including generating plants, electricity storage, interconnectors and electricity networks.
- 4.2.12 In terms of electricity generation, NPS EN-1 (Ref 4-2) recognises the importance of wind and solar, stating at paragraph 3.3.20, *“Wind and solar are the lowest cost ways of generating electricity, helping reduce costs and providing a clean and secure source of electricity supply (as they are not reliant on fuel for generation). Our analysis shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar.”* Energy generation through solar therefore plays an important role in the transition to net zero and in achieving energy security.

The Need for Battery Storage

- 4.2.13 Paragraph 3.3.25 of NPS EN-1 (Ref 4-2) recognises the role of electricity storage in meeting the need for nationally significant electricity infrastructure stating that *“Storage has a key role to play in achieving net zero and providing flexibility to the energy system, so that high volumes of low carbon power, heat and transport can be integrated.”* Paragraphs 3.3.26 to 3.3.27 of NPS EN-1 (Ref 4-2) describe the benefits of storage which include a reduction in electricity system costs, increased reliability through storing surplus electricity in periods of low demand to provide when demand is higher and maximising the usable output from intermittent low carbon

generation, such as solar, thereby reducing the total amount of generation capacity needed on the system. Paragraph 3.3.27 of NPS EN-1 (Ref 4-2) goes on to state that storage can provide a range of balancing services to help operate the system and reduce constraints on the networks, helping to defer or avoid the need for costly network upgrades as demand increases. Battery storage therefore plays an important role in the transition to net zero and provides additional storage capacity to benefit the wider electricity system.

Summary of Need

- 4.2.14 The UK has substantial renewable energy resources, including 40% of Europe's wind resource, with Government targeting 50GW of offshore wind to be operational by 2030. However, wind on its own is not considered sufficient on the basis that diversity in renewable generation sources is required to overcome the intermittent generation profiles of renewable energy sources. The development of large-scale solar projects in the UK (National Grid estimates up to 41.4GW by 2030 rising to 91.2GW by 2050) will provide an essential diversity to the UK's low-carbon generation portfolio, working with other technologies to deliver security of supply and value to UK consumers. The Energy Security Strategy (April 2022) has now set an ambition of 70GW of solar by 2035 (an increase of circa 55 GW from the current installed capacity). Solar generation is therefore critical to decarbonise the UK electricity sector and is already a leading low-cost generation technology in the UK. The national need for solar generation is urgent and the capacity required is significantly greater than the total capacity of projects currently understood to be in development.
- 4.2.15 Solar generation is already a leading low-cost generation technology in the UK as set out in the Cost of Energy Report (Ref 4-10) and is therefore a critical element of the plan to decarbonise the UK electricity sector.
- 4.2.16 Solar addresses all important aspects of existing and emerging government energy policy. It will make a critical and timely contribution to decarbonisation and security of supply in the UK, will help shield consumer bills from volatile energy prices and international supply markets, and provides the potential to deliver biodiversity net gains through its development.
- 4.2.17 In summary, the Proposed Development has a vital role to play in the urgent response needed to achieve decarbonisation, deliver net zero and achieve energy security.

4.3 Site Selection

- 4.3.1 The evaluation process for site selection explored a range of possible alternatives, considering key environmental, planning and access constraints, and including liaison with landowners.
- 4.3.2 There is no standard methodology for the site selection of solar energy farms. Paragraph 2.3.5 of NPS EN-3 (Ref 4-11) states that "*the government does not seek to direct applicants to particular sites for renewable energy*

infrastructure.” Instead, the NPS focuses on the general presumption in favour of granting consent for applications for renewable energy where there is an urgent need for this CNP infrastructure. National planning policy confirms that the presumption for development will in general outweigh any other residual impacts not capable of being addressed by the application through mitigation.

- 4.3.3 NPS EN-3 (Ref 4-11) does however set out general considerations relating to site selection for renewable energy projects. It refers to the need to consider national designation tests related to potential impacts upon biodiversity, landscape and visual considerations and the need to demonstrate that any significant effects on qualities for which the area has been designated are clearly outweighed by the urgent need for the Proposed Development. The Secretary of State should also have regard to the aims, goals and targets of the Government’s Environmental Improvement Plan (Ref 4-12) and other existing and future measures and targets in England, as well as compliance with the Environment Act 2021. Specific reference is also made to the historic environment given the statutory duty for the Secretary of State to give considerable importance and weight to the desirability of preserving all heritage assets.
- 4.3.4 Paragraph 2.3.9 of NPS EN-3 (Ref 4-11) recognises that *“most renewable energy resources can only be developed where the resource exists and where economically feasible, and because there are no limits on the need established in Part 3 of EN-1, the Secretary of State should not use a consecutive approach in the consideration of renewable energy projects (for example, by giving priority to the re-use of previously developed land for renewable technology developments).”*
- 4.3.5 NPS EN-3 (Ref 4-11) sets out the key considerations which influence the location of a solar farm, including:
- a. Irradiance and site topography;
 - b. Network connection;
 - c. Proximity to residential dwellings;
 - d. Agricultural land classification and land type;
 - e. Accessibility;
 - f. Public Rights of Way; and
 - g. Security and lighting.
- 4.3.6 It is these considerations which have informed the location of the Proposed Development as set out in the following paragraphs.

Irradiance and Site Topography

- 4.3.7 Irradiation levels from the sun and topography are key factors in the determination of identifying appropriate locations for solar development. The Applicant has identified Lincolnshire as an optimal area within the UK to

locate a large-scale solar development due to its good levels of irradiation and large areas of open flat land.

- 4.3.8 Large scale solar development is best located on flat land as this allows for greater constructability. It helps to reduce visual intrusion as panels can be screened easily due to the land not being elevated and there being fewer areas surrounding that are elevated. Flat land also limits the shading between solar PV panels.

Network Connection

- 4.3.9 Proximity to an available grid connection with appropriate capacity is fundamental to the viability and deliverability of a solar farm with associated Battery Energy Storage System (BESS). The Applicant undertook a search of available capacity within Lincolnshire and, following discussions with National Grid, secured a point of connection to a proposed forthcoming National Grid Substation at Navenby.
- 4.3.10 An initial area of search from the proposed point of connection at the proposed Navenby Substation was then established that would be economically viable for a solar farm that meets the export agreement with National Grid.
- 4.3.11 As part of the selection of land for the Principal Site, the Applicant sought to avoid large areas at the highest risk of flooding (Flood Zone 3) from its initial area of search from the point of connection at Navenby.

Proximity to Residential Dwellings and Consideration of Land Use, Planning and Environmental Constraints

- 4.3.12 To accord with national planning and environmental policy objectives from NPS EN-1 (Ref 4-2), NPS EN-3 (Ref 4-11) and the National Planning Policy Framework (Ref 4-13), proximity to residential dwellings and other planning and environmental designations, such as areas at the highest risk of flooding (Flood Zone 3) and best and most versatile land, were key considerations for the Applicant's site selection process. This helped to refine the initial area of search.
- 4.3.13 The Applicant sought to avoid urban areas, planning allocations and also sensitive landscape such as the Area of Great Landscape Value located west of Navenby, ecology, Green Belt, and heritage designations to refine the area of search. This also included avoiding areas at the highest risk of flooding (Flood Zone 3). The Principal Site layout sought to avoid solar PV and BESS infrastructure immediately surrounding residential dwellings and small settlements to minimise the potential for adverse impacts on visual amenity and glint and glare.

Agricultural Land Classification (ALC) and Land Type

- 4.3.14 There is a need to minimise the use of best and most versatile (BMV) agricultural land, which is classification grades 1, 2, and 3a, however

development is not prohibited from being located on BMV agricultural land. This is set out in NPS EN-1 (Ref 4-2); NPS EN-3 (Ref 4-11) and the NPPF (Ref 4-13) which expects impacts on best and most versatile agricultural land to be minimised and justified if used.

- 4.3.15 Paragraph 2.10.29 of NPS EN-3 (Ref 4-11) states that while land type should not be a predominating factor in determining the suitability of the site location, preference should be given to using brownfield and non-agricultural land. These land types were identified within the area of search by checking the local authority brownfield register and drawing on local knowledge. No suitable areas of brownfield or non-agricultural land at the appropriate scale were found.
- 4.3.16 As part of the desk-based land search around the point of connection, land east of Navenby was discounted due to likely higher grade agricultural land. Based on the provisional soil data, the majority of the proposed Principal Site was not classified as best and most versatile. This was later verified through soil surveys.

Accessibility

- 4.3.17 Suitable access for heavy goods vehicles (HGVs) and abnormal invisible loads (AIL) is preferred for straightforward construction of large-scale solar development. Large equipment and construction personnel will need to access the Principal Site, and therefore the Applicant considered the potential for HGV access in refining the area of search. During operation, the Principal Site will need to be accessed typically by light goods vehicles for maintenance activities. The Applicant selected land which has good access to the strategic and local road network including the A15 and A46. The suitability of access routes was confirmed through swept path analysis and traffic modelling studies.

Public Rights of Way

- 4.3.18 Section 3.10 of NPS EN-3 (Ref 4-11) identifies public rights of way (PRoW) as a factor for consideration by applicants in site selection and the design of large-scale solar farms. In selecting the land for the Proposed Development, the Applicant sought to, where possible, avoid land which was crossed by a PRoW. Where land was identified with a PRoW present, consideration was then given to the potential size of the developable area for solar PV infrastructure which would remain following the application of buffers around PRoW. The Applicant is seeking the retention and addition of permissive paths within the design of the Proposed Development as shown in **PEI Report Volume 2 Figure 3-3** to increase the connectivity in the area.

Site Selection Summary

- 4.3.19 In summary, the key considerations for site selection as set out in NPS EN-3 (Ref 4-11) have been considered by the Applicant in determining the location of the Principal Site. Taking account of the suitability of the location for solar, the availability of a network connection, appraisal of environmental

constraints and land availability, the site was selected to be taken forward for development.

4.4 Alternative Solar Infrastructure Technologies and Storage Arrangements

- 4.4.1 As described in **PEI Report Volume 1, Chapter 3: The Proposed Development**, the parameters of the DCO application will maintain some degree of design flexibility to allow the latest technology to be utilised at the time of construction. Notwithstanding this, several technological design options have been considered and preferred options taken forward taking into consideration environmental effects and the Proposed Development's objectives and need for optimal functionality. **Table 4-1** summarises the technological design alternatives considered in the design evolution of the Proposed Development.

Table 4-1: Technological Alternatives

Design Technology Element	Considerations
Solar PV technology and arrangement	The solar PV technologies considered are south facing fixed arrays and single axis tracking arrays. Both technologies are included within the parameters that have been assessed. East-west fixed arrays were discounted by the Applicant early on in the process as not being suitable for the Site. East-west fixed arrays are associated with lower renewable energy generation yield; they require denser ground coverage resulting in less sunlight reaching the ground, lower biodiversity gain, reduced the opportunity for sheep grazing. The east-west fixed option would also generate more construction traffic due to the larger volume of panels needing to be installed.
BESS arrangement	The BESS technologies considered are a 'direct current (DC) coupled' system distributed around the site and an 'alternating current (AC) coupled' system grouped within one area of the Site. Both technologies are included within the parameters that have been assessed.
Arrangement of transformers, switchgear and inverters)	The exact size and arrangement of the inverter and transformer stations would be determined at a detailed design stage and a suitable area has been left for the flexibility of options. The maximum parameters (height, size and noise etc.) of the equipment will be used for the assessment. The options are discussed in PEI Volume 1, Chapter 3: The Proposed Development .
PV height	The height of the modules will vary between the fixed south arrangement and the single axis trackers. The maximum required height has been outlined in the Proposed Development PEI Volume 1, Chapter 3: The Proposed Development . Shorter panels were discounted because of the lower energy yield they would generate, whilst higher panel would be more difficult to

Design Technology Element

Considerations

	screen, likely to lead to greater visual impacts and were therefore equally ruled out.
Grid connection option – cabling technology	At the EIA Scoping Stage consideration was given to the provision of either overhead or underground cabling to provide a connection from the Onsite Substation to the point of connection at the proposed National Grid Substation at Navenby. The Proposed Development now comprises solely underground cables within the Cable Corridor, with overhead lines no longer being considered. The decision was taken to avoid likely significant effects on landscape and visual associated with overhead cables.

4.5 Alternative Layouts within the Principal Site

- 4.5.1 The layout of the Proposed Development has evolved iteratively and will continue to evolve through the EIA process taking into consideration environmental effects, the Proposed Development's objectives and functionality, and feedback from stakeholders during both the non-statutory and the Statutory Consultation process.
- 4.5.2 The Design and Access Statement, which will be submitted with the DCO application, will explain the design evolution of the Proposed Development. Table 4-2 summarises the main design layout iterations considered so far for the Proposed Development, including that for the Principal Site. The following figures illustrate the changes in terms of land area:
- Figure 4-1: EIA Scoping Site Boundary** (which illustrates the boundary at EIA Scoping Stage) (PEI Report Volume 2); and
 - Figure 1-1: Proposed Development Location** (which illustrates the Site Boundary for this PEI Report) (PEI Report Volume 2).

4.6 Alternative Cable Corridors

- 4.6.1 An optioneering process has been undertaken to identify the Cable Corridor for the Proposed Development to connect to the proposed Navenby Substation.
- 4.6.2 As described in **PEI Report Volume Chapter 3: The Proposed Development**, the electricity generated by the Proposed Development is to be imported and exported via interface cables from the Onsite Substation. The Cable Corridor therefore needs to connect the onsite substations to the proposed Navenby Substation.
- 4.6.3 Three Cable Corridors were considered at EIA Scoping (June 2023). The three corridors considered are shown on **PEI Report Volume 2 Figure 4-1**. In addition at EIA Scoping the Proposed Development was considering the

provision of underground cabling or overhead lines. The overhead line option has been removed and the Proposed Development comprises solely underground cabling within the Cable Corridor to the point of connection at the proposed National Grid Navenby Substation.

- 4.6.4 An options appraisal exercise was undertaken to identify and review the planning, engineering, property and environmental constraints within each of the potential corridors. This resulted in a reduction of the Cable Corridor options, with two possible alignments considered at non-statutory consultation (September 2023), as shown in **PEI Report Volume 2 Figure 4-2**. Following non-statutory consultation, the Cable Corridor has been refined to a single corridor, as illustrated in **PEI Report Volume 2 Figure 1-2** and described in **PEI Report Volume 1 Chapter 3: The Proposed Development**.
- 4.6.5 **Table 4-2** summarises the main iterations considered so far for the Proposed Development, including that for the Cable Corridor.

4.7 Overview of Design Development

- 4.7.1 **Table 4-2** provides an overview of the Proposed Development in the different stages of the design process, including the key design decisions that have been made between each and how the design has evolved.

Table 4-2: Main Design Layout Iterations for the Principal Site and Cable Corridor

Stage	Proposed layout	Consultation which influenced the proposed layout at this stage	Design evolution
EIA Scoping Layout (June 2023)	Principal Site Comprised several parcels of land within the Principal Site (1,060ha) Cable Corridor Three grid connection cable corridors were shown. The Scoping Report Boundary has an area totalling 4,410ha. Shown on Figure 4-1, PEI Report Volume 2	This was prior to extensive consultation with relevant stakeholders and therefore was not influenced by external parties.	The EIA Scoping boundary was produced with data from desk based and preliminary environmental surveys and was adopted with a view to including the Scoping Report any land that could ultimately be within the Site. The intention was that the area would be further refined following surveys, environmental assessment, and consultation.
Non-Statutory Consultation Layout (September 2023)	Principal Site Comprised several parcels of land within the Principal Site (1,003ha). Cable Corridor Two grid connection cable corridors were shown.	Landowner discussions and agreements. Environmental surveys and desktop study, including landscape and visual, ecology, heritage, noise, transport, water and flood risk.	The Non-Statutory Consultation Layout was developed with the feedback from the EIA scoping process including the Scoping Opinion, the design team, preliminary environmental mitigation recommendations and ongoing landowner discussions. Whilst similar constraints have been identified for the two connection corridors the northern grid connection option has been removed from the Proposed Development as it would result in a longer cable route affecting additional land owners and resulting in additional temporary impacts.

Stage	Proposed layout	Consultation which influenced the proposed layout at this stage	Design evolution
	The non-statutory consultation boundary has an area totalling 3,498ha. Shown on Figure 4-2, PEI Report Volume 2	Grid connection options analysis.	
PEI Report Layout (October 2024)	The current Site totals 1,426ha, comprising the Principal Site (1,065ha) and a single Cable Corridor partially overlapping with the Principal Site (407ha). Shown on Figure 1-2, PEI Report Volume 2	Landowner discussions and agreements. Non-statutory consultation feedback. Agricultural Land Classification Surveys. Environmental surveys and desktop study, including landscape and visual, ecology, heritage, noise, transport, water and flood risk. Grid connection options analysis.	Principal Site The boundary of the Principal Site has been further refined to exclude individual residential properties. BESS Area has been identified within the Site for the AC-coupled BESS option, in addition to the DC-coupled BESS that is sited alongside the Solar and BESS Stations (noting that only one configuration of BESS will ever be delivered, and not both or a mix of both). The design has been further developed for the PEI Report to respond to the environmental opportunities and constraints for the Site and non-statutory consultation feedback, including, amongst others, minimising visual impacts, creating links across the Principal Site and reducing potential operational noise impacts associated with solar infrastructure. In addition, the Proposed Development has located all Solar Station Compounds away from Flood Zones 2 and 3. The larger elements of the solar farm, such as the Onsite Substation and BESS, have been carefully located in areas of reduced flooding and screening from existing vegetation and topography.

Stage	Proposed layout	Consultation which influenced the proposed layout at this stage	Design evolution
			An area of land previously containing solar infrastructure south of Moor Lane has been removed to reduce the impact on ground nesting birds habitat located on this land. As a result of landowner discussions and further environmental assessment an area to the north of the A46, land has been included for the deployment of solar panels to maximise the opportunities to deliver clean energy. Additional changes have been made in the vicinity of Cathedral View Holiday Park and in land southeast of Thorpe on the Hill to provide additional buffers from the Solar PV Array Areas. Around River Farm (Grade II listed) the Solar PV Array Areas were arranged to follow historic field boundaries and maintain intervisibility between River Farm and Church Farm (non-designated monument) which forms the setting of these two heritage assets. The design of the Solar and BESS Stations has been optimised to aggregate these as much as possible to minimise the number of water tanks that may be requested by the local fire and rescue teams should the DC-coupled BESS option be selected for development. Permissive paths have been included to show the Applicant's intention for greater connectivity between the local villages and provision of shorter circular walks. Proposed planting has also been added. Cable Corridor

Stage	Proposed layout	Consultation which influenced the proposed layout at this stage	Design evolution
			Further refinement to the Cable Corridor has been undertaken, with a single, approximately 250m wide route included within the Site. The refinement of the Cable Corridor has considered: • Feedback from Non-Statutory Consultation including concerns related to the provision of additional overhead lines; • The likely point of connection at proposed National Grid Navenby Substation; • Optimisation of the corridor so the cable can be laid in a straight line or in shallow curves so that the cable can be pulled through the ducting effectively; • Provision of adequate space to allow for crossing on existing utilities such as the existing overhead lines and the new Anglian Water main; • Access to the corridor during construction; and • Provision of adequate space required to undertake the works to lay the cable.

4.8 Summary

- 4.8.1 The objective of the Proposed Development is to deliver significant amounts of low carbon energy to meet the UK's urgent need for low carbon electricity and to help the Government meet its legal and policy obligations with regards to climate change and net zero.
- 4.8.2 Following statutory consultation, the feedback received will be reviewed and will further inform the design of the Proposed Development. The design of the Proposed Development will continue to evolve through the EIA and design process, taking into consideration the consultation feedback and environmental effects. Options considered by the Applicant through this process will be reported in more detail in the Environmental Statement and other supporting documentation to be submitted with the DCO application.

4.9 References

- Ref 4-1 The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017).
- Ref 4-2 Department for Energy Security & Net Zero (2023). Overarching National Policy Statement for Energy (EN-1).
- Ref 4-3 Intergovernmental Panel on Climate Change (IPCC) Synthesis Report of the IPCC Sixth Assessment Report (2023). Available at: https://report.ipcc.ch/ar6syrr/pdf/IPCC_AR6_SYR_SPM.pdf
- Ref 4-4 The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111187654>
- Ref 4-5 The Climate Change Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/27>
- Ref 4-6 European Parliament (2023). COP28 climate talks agree on transitioning away from fossil fuels.
- Ref 4-7 Climate Change Committee (CCC) (2024). Progress on reducing emissions. 2023 Report to Parliament. Available at: <https://www.theccc.org.uk/wp-content/uploads/2024/07/Progress-in-reducing-emissions-2024-Report-to-Parliament-Web.pdf>
- Ref 4-8 Department of Energy and Climate Change (DECC) (2011). Overarching National Policy Statement for Energy (EN1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
- Ref 4-9 Department for Business, Energy and Industrial Strategy (2022). British Energy Security Strategy. Available at: <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>
- Ref 4-10 Department for Energy Security & Net Zero (2023) Electricity Generation Costs 2023. Available at: <https://assets.publishing.service.gov.uk/media/6556027d046ed400148b99fe/electricity-generation-costs-2023.pdf>
- Ref 4-11 Department for Energy Security & Net Zero (2023). National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: <https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf>
- Ref 4-12 Department for Environment, Food & Rural Affairs (2023). Environmental Improvement Plan 2023.
- Ref 4-13 Ministry of Housing, Communities and Local Government (2023). National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>