



Botley West Solar Farm

Preliminary Environmental Information Report

Volume 1

**Chapter 5: Need, National Planning Policy, and
Alternatives Considered**

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Approval for issue

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Glossary

Term	Meaning
The Applicant	SolarFive Ltd
The Project	The Botley West Solar Farm (Botley West) Project

Abbreviations

Abbreviation	Meaning
BEIS	Department for Business, Energy and Industrial Strategy
BESS	Battery Energy Storage System
CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Utilization and Storage
COP	Conference of Parties
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
dNPS	Draft Overarching National Policy Statement
EIA	Environmental Impact Assessment
EDF	Électricité de France S.A.
ESO	Electric System Operator
ExA	Examination Authority
HDD	Horizontal Directional Drilling
NETS	National Electricity Transmission System
NGET	National Grid Electricity Transmission
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIPs	Nationally Significant Infrastructure Projects
OHL	Overhead Line
PA	Planning Act
PEIR	Preliminary Environmental Information Report
POC	Point of Connection

Abbreviation	Meaning
SoS	Secretary of State
TNUoS	Transmission Network Use of System

Units

Unit	Description
GW	Gigawatt
ha	Hectares
Kv	Kilovolt
kWh	Kilowatt Hour (Power unit)
MW	Megawatt

5 Need, National Planning Policy, and Alternatives Considered

5.1 Introduction

5.1.1.1 This chapter of the PEIR provides a summary of the need for the Project, a review of relevant national planning policy (relevant Local Planning policy will be set out in a Planning Supporting Statement that will accompany the DCO submission), as well as the main alternatives considered by the Applicant during the project development and EIA process. It includes a summary of the reasons for the selection of the site, its scale, together with a description of the alternative design and layout options that have been considered to date, having regard to relevant environmental effects.

5.2 Need

5.2.1.1 The UK faces a series of challenges to the security of its energy system and the climate change impact of its energy generation. The risk of relying on gas has recently been highlighted to the public, but the underlying strategy towards security of supply and moving to a low carbon economy has been in place for many years. The Government, through the Climate Change Act 2008, set legally binding carbon budgets, requiring the UK to reduce its greenhouse gas emissions by 100% from 1990 levels, known as ‘net zero’, by 2050. This makes decarbonisation in the UK a legal requirement, and is a matter of global significance. In order to achieve this, the UK must decarbonise its energy system, electrify heating, industry and transport. This will result in a significant increase in the use of electricity, at the same time as seven of the UK’s eight nuclear power stations close along with all remaining coal power stations.

5.2.1.2 The Government’s recently published ‘British Energy Security Strategy’¹ (April 2022) makes clear that the Government intends to rely upon wind, solar, hydrogen and nuclear in order to replace our reliance upon fossil fuels, to bring energy costs down and, above all, make our supply of energy secure. In respect of solar, whilst only contributing approximately 2.4% of the UK’s total electricity generation (DESNZ Energy Trends, Table 1.1) the Government expects a five-fold increase in deployment by 2035. In 2022 the total installed solar capacity in the UK stood at approximately 14GW - a five-fold increase is approximately 70GW of solar power, meaning we still need approximately another 55GW of new solar.

5.2.1.3 In the ‘Powering Up Britain Energy Security Plan’, 2023, security and lowering of energy prices remains a priority. It states that the “...*strategy to increase supply of low-carbon energy is dependent on enhancing our strengths on wind, solar and nuclear power generation alongside*

¹ [British energy security strategy - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/british-energy-security-strategy)

hydrogen production and carbon capture, usage and storage. This includes the infrastructure to produce, store and transport low-carbon energy around the country and to capture, transport and store carbon dioxide. We aim to remove barriers and address blockages, whilst developing new options....” This Plan reaffirms the Government’s key commitment of achieving 70GW of solar by 2035.

- 5.2.1.4 The challenges that developers face in land assembly, the consenting process, as well as Grid constraints mean this is a challenging target. In the Applicants’ view the Government target of 70GW of solar by 2035 cannot be achieved by rooftop solar panels and brownfield sites alone. In the UK the cost of mounting and connecting solar panels to roofs of buildings has to be borne by the individual occupier/owner and for many these costs are prohibitive and achieving consent sometimes difficult or impossible too e.g. on or nearby Listed Buildings or in Conservation Areas and Areas of Outstanding Natural Beauty. Brownfield land is often in urban areas, is sometimes physically constrained in terms of size and competes with many other land uses for development, in particular residential development, which can generate higher land values. Whilst any contribution from these locations is welcomed, in the Applicant’s view it will require large scale solar power stations delivering large amounts of power to the National Grid, making best use of scarce Grid connections to help deliver the amount of solar power now required.
- 5.2.1.5 In Draft EN NPS 3 (dNPS EN3), March 2023, (paragraph 3.10.14) the Government recognises that agricultural land may have to be used to deliver the energy we need.
- 5.2.1.6 Botley West is a project designed to spearhead the renewable transformation of UK generation. The UK grid is constrained, and the 400 kV overhead line (OHL) network is being reinforced across the country. This means that in many areas no new generation can be connected until 2032 or later. At Botley West, however, the Applicant has an OHL with capacity, land for a new substation, and a substation at Cowley which has already been extended by National Grid. The Applicant has approximately 1300 ha of suitable land available to deliver a large scale solar farm to meet a pressing National need. Also, the Oxfordshire economy is strong and is growing, so there is a demand for more, reliable renewable energy in the county, which Botley West will deliver - enough to power the equivalent of approximately 330,000 homes (based on the Government estimate of annual average household power consumption of 4000 kWh). National Grid will invest in the local high-voltage network, and power will flow into the grid from October 2027.

5.3 National Policy Context

National Policy Statements

- 5.3.1.1 National Policy Statements (NPS) set out the primary basis for NSIP developments. There are NPS’s for Energy, Transport, Water and Waste. There are six Energy NPSs, each covering one of the following matters: overarching energy policy; fossil fuels; renewable energy; oil and gas supply and storage; electricity networks; and nuclear power. The Energy

NPSs are specific in terms of which energy generation technologies they cover. There is currently no NPS in force that specifically includes solar development. Currently therefore, the application for a DCO is required to be decided in accordance with Section 105 of the PA 2008. This states that in deciding an application for a DCO where an NPS does not exist for the type of development applied for, the SoS must have regard to:

- any Local Impact Report (Section 105(2)(a) of the PA 2008);
- any matters prescribed in relation to development of the description to which the application relates (Section 105(2)(b) of the PA 2008); and
- any other matters which the SoS thinks are both important and relevant to the Secretary of State’s decision (Section 105(2)(c) of the PA 2008).

5.3.1.2 In terms of the NPS’s, The Energy NPSs were designated on 19 July 2011. They set out matters, principles and impacts that should form the basis of the SoS’s decision on DCO applications for Energy NSIPs.

5.3.1.3 NPS EN-1 sets out general principles and impacts to be taken into account for all types of energy NSIP development covered by the Energy NPSs. It forms the primary basis for determining if development consent should be granted for development in the energy sector. EN-1 states that large scale renewable energy projects are needed (amongst other types of generation capacity) in order to meet the demand for electricity generation in the United Kingdom (UK), and to reduce greenhouse gas emissions from electricity generation in order to meet the Government’s decarbonisation targets.

5.3.1.4 NPS EN-1 sets out at paragraph 4.1.2 that given the level of urgency of need for infrastructure of the types covered by the energy NPS’s, the SoS should start with a presumption in favour of granting consent to applications for energy NSIPs. It states that the presumption applies unless any more specific and relevant policies set out in the relevant NPSs clearly indicate that consent should be refused.

5.3.1.5 NSIP solar developments, particularly at large scale, have considerable potential to make a direct contribution to meeting the objectives of NPS EN-1. As set out at paragraph 2.1.1 of NPS EN-1, these are to help meet the Government’s objectives to deliver carbon emission reductions, energy security and affordability. Therefore, NPS EN-1 should be considered of primary importance and relevance to the Project and the SoS’s decision.

5.3.1.6 NPS EN-3 sets out additional policies for renewable energy infrastructure that should be read in addition to the overarching policies set out in NPS EN-1. It does not include solar energy projects within its scope and explains that at the time of designation in 2011, types of onshore renewable energy generation not specifically covered within the document were excluded as they were not technically viable at a scale of more than 50MW at the time it was written. However, solar technology has now advanced to an extent that it is now viable at a nationally significant (>50MW) scale. This is evident by the number of large scale solar schemes now coming forward for consent.

- 5.3.1.7 NPS EN-5 principally concerns high voltage long distance transmission and distribution infrastructure (400kV and 275kV lines), and lower voltage lines (132kV to 230kV) from transmission substations to end user. The Project incorporates a new National Grid substation and related infrastructure and so is relevant to the decision maker.
- 5.3.1.8 NPS EN-5 is likely to be considered important and relevant due to the inclusion within the Project of inverters, transformers, switchgear, cabling, and substations that form part of the Project. At paragraph 2.2.1 it states that It is for electricity network companies, responding to actual and anticipated changes in the patterns of supply and demand within the framework of regulation of new investment administered by Ofgem, to decide what applications for new electricity networks infrastructure to bring forward and the Government does not seek to direct applicants to particular sites or routes for electricity networks infrastructure. At paragraph 2.3.1 it states that “...EN-1 explains in Section 4.9 that the Planning Act aims to create a holistic planning regime so that the cumulative effects of different elements of the same project can be considered together. Therefore the Government envisages that, wherever reasonably possible, applications for new generating stations and related infrastructure should be contained in a single application to the IPC...” (now the Planning Inspectorate).
- 5.3.1.9 The Energy NPSs were prepared specifically to address the particular balance of impacts and benefits likely to emerge from energy projects that are of such a scale that their contribution to meeting the government’s energy objectives is of national significance. As such, the Applicant considers NPS EN-1, NPS EN-3 and NPS EN-5 to be important and relevant to the determination of the Application, and to form the primary decision-making framework for the Project.

Draft Energy Policy Statements

- 5.3.1.10 The Government is currently reviewing and updating the Energy NPSs. This review will reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country’s transition to net zero carbon. As part of the Energy NPS review process, the Government published a suite of Draft Energy NPSs (dNPS) for consultation. These include a dNPS for Renewable Energy (EN-3) (dNPS EN-3), March 2023, which includes specific policies for solar photovoltaic generation NSIPs.
- 5.3.1.11 The designation of dNPS EN-3 will bring solar NSIP developments into the coverage of the Energy NPSs. However, it is not yet known whether the dNPS EN3 will have been designated before the Botley West Solar Farm application has been accepted for examination. If it is not designated, then the transitional arrangements mean that the SoS will still be required to decide the application in accordance with the matters set out under S105 of the Planning Act 2008. These include any other matters which the SoS thinks are both important and relevant to their decision (Section 105(2)(c) of the PA 2008). Paragraph 1.6.3 of dNPS EN-1 sets out that the Draft Energy NPSs are capable of being

considered such matters. The Applicant considers the following dNPSs to be important and relevant matters in the SoS's determination of the Application:

- a. Draft Overarching National Policy Statement for Energy (EN-1) (dNPS EN-1), March 2023,
- b. Draft National Policy Statement for Renewable Energy (EN-3) (dNPS EN-3), March 2023, and
- c. Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (dNPS EN-5), March 2023.

5.3.1.12 The transitional arrangements set out by paragraph 1.6.2 of dNPS EN-1 explain that for any application accepted for examination before designation of the dNPSs, the current NPSs, which were enacted in 2011, should have effect. However, paragraph 1.6.2 of dNPS EN-1 of sets out that: "any emerging draft NPSs (or those designated but not having effect) are potentially capable of being important and relevant considerations in the decision making process. The extent to which they are relevant is a matter for the relevant SoS to consider within the framework of the Planning Act and with regard to the specific circumstances of each development consent order application."

5.3.1.13 The Applicant expects that the specific circumstances of this Application are such that dNPS EN-1 and dNPS EN-3 will be important and relevant matters and will be given significant weight in the ExA's recommendation and the SoS's decision and that the weight attached to them is likely to increase through pre-examination/examination once they are designated.

5.3.1.14 In a recent decision on another NSIP solar project (Longfield Solar, June 2023) the SoS confirmed a Development Consent Order and as part of that decision the issue of weight to be attached to the dNPS was set out. In paragraph 4.6 and 4.7 of his decision letter it states:

"...The ExA considers that all forms of renewable generation, including solar, have an urgent role to play in contributing to increased energy supply and security in meeting net zero, and considers the need for the Proposed Development.." "The ExA notes that the Climate Change Act 2008 places a duty on the Secretary of State to reduce the net UK carbon account for 2050 to at least 100% lower than the 1990 baseline, and considers that the Proposed Development would make a modest contribution to the UK meeting that legally binding commitment....". "More recently, the ExA notes that Powering Up Britain (published March 2023), recognises the role of solar in achieving the decarbonisation and domestication of energy production and sets a goal to increase solar generation fivefold by 2035, recognising that ground mounted solar is one of the cheapest form of electricity generation and is readily deployable at scale...." "The ExA concludes that the Proposed Development would positively contribute to the urgent need established in designated NPSs, and carried forward into dNPSs, for additional low carbon generation, and that this should be afforded significant positive weight....".

While the Secretary of State acknowledges that EN-1 does not have effect in relation to solar, and therefore section 104 of the 2008 Act does

not apply, the need for solar is established in the dNPSs and is a matter he considers to be important and relevant to this decision under section 105 of the 2008 Act. The Secretary of State agrees with the ExA’s conclusions and ascribes the Proposed Development’s contribution to meeting this need substantial positive weight in the planning balance...”

- 5.3.1.15 In terms of content, dNPS EN-1 sets out general principles and impacts to be taken into account for all types of energy NSIPs covered by the Energy NPSs. Once designated it will form the primary basis for determining if development consent should be granted and is underpinned by the principle that the development of large-scale renewable energy generation infrastructure is urgently needed in order for the Government’s targets and commitments for the energy system to be met. It sets out at paragraph 3.3.20 that 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). The Government’s analysis shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar (DESNZ Modelling 2050 – electricity system analysis, December 2020).
- 5.3.1.16 dNPS EN-3 sets out additional policies for renewable energy infrastructure, including policies specific to the development of solar NSIPs. These include matters that applicants should consider in selecting a site, how assessments should be undertaken and how mitigation should be provided. dNPS EN-3 should be read in addition to the overarching policies set out in Draft NPS EN-1.
- 5.3.1.17 In terms of site selection and design at paragraph 3.10.9 it introduces a number of different factors. The dNPS goes onto to state that these include, amongst others:
- Irradiance levels;
 - Proximity of site to dwellings;
 - Agricultural land classification and type;
 - Accessibility and public rights of way, and
 - Network connection
- 5.3.1.18 Like NPS EN-5, dNPS EN-5 transmission and distribution infrastructure that covers long distances and is at a high voltage. As the Applicant currently subsumes the NGET substation into which the Project will be connected, this NPS remains relevant. It is likely that dNPS EN-5 will be a material consideration and relevant in respect of the electrical infrastructure that form part of the Project.

Other Considerations

National Planning Policy framework

- 5.3.1.19 Paragraph 152 of the NPPF also supports the transition to a low carbon future and expects the planning system to contribute to “radical reductions in greenhouse gas emissions” by supporting renewable and

low carbon energy and associated infrastructure. Paragraph 158 of the NPPF expects the determination of planning applications to “not require applicants to demonstrate the overall need for renewable or low carbon energy” and “approve the application if its impacts are (or can be made) acceptable”. This statement does not require that there should be no significant environmental effects, but that those effects should be ‘acceptable’.

Kyoto Protocol 1997

- 5.3.1.20 The Kyoto Protocol brings the United Nations Framework Convention on Climate Change into use by committing industrialised countries and economies to limiting and reducing greenhouse gas emissions in accordance with agreed individual targets. The Convention asks those countries to adopt policies and measures on mitigation and to report periodically.

The United Nations Adoption of the Paris Agreement COP21

- 5.3.1.21 A total of 197 countries, including the UK, adopted the Paris Agreement at the 21st Conference of the Parties (COP21) in Paris in 2015. This is a legally binding international treaty that seeks to reduce global greenhouse gas emissions and to limit the global temperature increase in this century to 2°C, while pursuing the means to limit this further to 1.5°C.

The UK Climate Change Act 2008 (as amended)

- 5.3.1.22 In November 2008, the Climate Change Act became law requiring the UK to reduce carbon dioxide (CO₂) emissions. This was updated in 2019 to provide a legal basis for the target of securing a 100% reduction of greenhouse gas emissions to be achieved by 2050 (compared to 1990 levels).

National Infrastructure Strategy, 2020

- 5.3.1.23 The National Infrastructure Strategy focuses on the investment and delivery of infrastructure, which is fundamental to delivering net zero emissions by 2050 (HM Treasury, 2020). The strategy sets out the UK Government’s plans to deliver on this target, decarbonising the economy and adapting to climate change:
- Work towards meeting the net zero emissions target by 2050 – Decarbonise the UK’s power, heat and transport networks, and take steps to adapt to climate change impacts. This will require increased investments in network infrastructure, storage and increased low carbon generation capacity.
 - Reducing emissions across whole sectors of the economy must be done in a sustainable way that minimises cost.

Conference of Parties 26th Session (COP26)

- 5.3.1.24 At the COP26 summit in November 2021, parties voted to adopt the draft COP26 report (UNFCCC, 2021), known as the Glasgow Climate Pact. This included commitments to phase down the use of coal and supports a common timeframe and methodology for national commitments on emissions reductions. Countries were tasked to return in 2022 with more ambitious 2030 emissions reductions targets.

The UK Energy Security Strategy

- 5.3.1.25 The UK Energy Security Strategy (HM Government, April 2022) emphasises the need to be more energy independent as a nation, aiming to improve energy efficiency, accelerate the transition from fossil fuels, and expand the renewable energy capacity.
- 5.3.1.26 The Strategy highlights the importance of solar energy as a key component of the move to renewables, and seeks a five-fold increase in the provision of solar development to increase its energy generation to 70GW across the UK by 2035.

The HM Government Energy White Paper - Powering our Net Zero Future

- 5.3.1.27 Following the Prime Minister's ten-point plan for a green revolution (HM Government, 2020a), and National Infrastructure Strategy (HM Government, 2020b), the White Paper (HM Government, 2020c) marks a significant milestone in the UK's net-zero transition, setting a net-zero target by 2050 and outlining how this may be achieved. It relates to the generation, supply and use of energy with the drive towards net zero by 2050 at its core, along with energy efficient buildings and lower household bills. It signals a decisive move away from fossil fuel generation and highlights how planned Government investment has the potential to leverage billions of pounds more in private sector funding and support for over 250,000 jobs in the green economy by 2030.

Net Zero Strategy: Build Back Greener, 2021

- 5.3.1.28 This strategy sets out the UK's long-term plans to meet net zero emissions by 2050 and gives the vision for a decarbonised economy in 2050 (BEIS, 2021).
- 5.3.1.29 The policies detailed in the strategy will be phased in over the next decade or beyond in order to continue decarbonisation towards net zero. They also aim to keep the UK on track to meet upcoming carbon budgets.
- 5.3.1.30 This strategy brings forward the ambition for a fully decarbonised power system by 15 years, building on the targets set out in the Energy White Paper and the 10 Point Plan for a Green Industrial Revolution. The ambition is to fully decarbonise the UK's power system by 2035, through the growth in renewable and nuclear power in addition to an increase in energy storage capacity, gas with CCS, and hydrogen to increase the flexibility of supply.

- 5.3.1.31 The electricity system will be composed predominantly of wind and solar generation, with a planning increase in offshore wind generation to 40 GW by 2030. To ensure the system is able to reliably meet demand, wind and solar supplied will be complemented by nuclear power and Carbon Capture Utilisation and Storage (CCUS). Flexible technologies, such as interconnectors, electricity storage, and demand-side response, will be implemented to help to minimise the amount of generation and network capacity is needed to meet demand needs.
- 5.3.1.32 Further, the strategy outlines aim to support the decarbonisation of the construction and building sector. Reporting on embodied carbon in buildings and infrastructure is sought to be improved, alongside reductions in embodied carbon by way of material substitution, where appropriate, and resource efficiency.
- 5.3.1.33 The strategy recognises the importance of addressing the risks of carbon leakage, so policy interventions within the UK do not lead to increased emissions elsewhere. Options will continue to be explored to mitigate carbon leakage, with key efforts to address it through global action on industrial decarbonisation and climate regulation, with continued monitoring of related global policy developments.

Overall Need - Conclusion

- 5.3.1.34 NPS EN-1 sets out that the delivery of a large amount of renewable generation capacity is urgently required for delivery of the government’s energy objectives and commitments. In addition, dNPS EN-1 sets out that the delivery of a large amount of solar generation capacity, in particular, is an essential element required for delivery of the Government’s energy objectives and legally binding net zero commitments. As such, dNPS EN-1 sets out at paragraphs 4.1.2 and 3.1.2, respectively, that the basis for any decision on an application for an energy NSIP, including a solar farm NSIP, should be:
- a. a presumption in favour of granting development consent; and
 - b. substantial weight should be given to the established need for energy infrastructure.
- 5.3.1.35 Although it does not specifically refer to solar generation, NPS EN-1 also sets out at paragraphs 4.1.2 and 3.2.3 that the two principles above should form the basis for any decision on an application for an energy NSIP.
- 5.3.1.36 Paragraph 152 of the NPPF also supports the transition to a low carbon future and expects the planning system to contribute to “radical reductions in greenhouse gas emissions” by supporting renewable and low carbon energy and associated infrastructure. Paragraph 158 of the NPPF expects the determination of planning applications to “not require applicants to demonstrate the overall need for renewable or low carbon energy” and “approve the application if its impacts are (or can be made) acceptable”. This statement does not require that there should be no significant environmental effects, but that those effects should be ‘acceptable’.

- 5.3.1.37 NPS EN-1 paragraph 3.2.3 and dNPS EN-1 paragraph 3.1.2 acknowledge that: “...as noted in Section 1.7, it will not be possible to develop the necessary amounts of such infrastructure without some significant residual adverse impacts.” This statement is present in most NPSs because it is rarely possible to delivery NSIPs without significant effects due to their scale. The NPPF requirement for impacts to be ‘acceptable’ should be considered in the context of a scale of project whereby significant environmental effects are likely to be unavoidable.
- 5.3.1.38 There is a strong need case for the increase in UK based renewable energy. This filters down at international level from commitments and obligations, such as the Kyoto Protocol and COP21 and more recently COP26. At a national level, legally binding targets of net zero by 2050, the phasing out of fossil fuel generation by 2035 and an expansion of low carbon energy supplies so that renewable make up 80% of the generation by 2050 all further support the urgent need case for the Project. Looking at solar specifically, the UK Energy Security strategy highlights the importance of solar energy in the move towards renewables and it outlines that it seeks solar generation to reach 70 GW by 2035. Given the generating capacity of the Project, if consented the Project would significantly help contribute towards this need.

5.4 Alternatives

- 5.4.1.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 require that an EIA Report should include:
- “A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects’ (Schedule 4(2)).*
- 5.4.1.2 It is also important to note the guidance in respect of ‘alternatives’ in NPS EN-1 at section 4.4.3. Here it states that “... where (as in the case of renewables) legislation imposes a specific quantitative target for particular technologies or (as in the case of nuclear) there is reason to suppose that the number of sites suitable for deployment of a technology on the scale and within the period of time envisaged by the relevant NPSs is constrained, the IPC should not reject 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...”.
- 5.4.1.3 Also it states that “... alternatives not among the main alternatives studied by the applicant (as reflected in the ES) should only be considered to the extent that the IPC thinks they are both important and relevant to its decision....”.
- 5.4.1.4 This section therefore sets out the key reasons for pursuing this renewable project in principle; the selection of the site and the current scale and layout; approach to site layout, and the solar and cable

systems chosen, all having regard to the desire to minimise any adverse environmental effects.

Do Nothing

- 5.4.1.5 The consequence of a do-nothing scenario, i.e. not to develop the type of project in principle, is that the need for renewable energy to displace fossil fuel energy sources, to provide the UK with energy security, and to achieve net zero by 2050, may not be met without the Project and others like it. Nationally policy (NPS EN1, EN3 and dNPS NPS EN1 and EN3) encourages rather than discourages renewable energy developments as the need for them is urgent. A do-nothing strategy would materially undermine the Government's strategy and ability to meet its legally binding obligations and to deliver the target 70GW of solar by 2035.

Site Location and Scale

- 5.4.1.6 The location and scale of the Project site was driven by a number of factors. It evolved over a period of several years, beginning in July 2019. At that time discussions were held with National Grid to identify where their priorities lay in order to meet demand and manage the UK electricity supply network. They directed the Applicant towards the Transmission Network Usage System (TNUoS), managed by National Grid as the Electricity System Operator (ESO), and regulated by Ofgem.
- 5.4.1.7 TNUoS is a charge, set to recover the cost of the installation and maintenance of the transmission network. The ESO recovers the revenue on behalf of all onshore and offshore transmission owners and other network schemes. TNUoS is currently paid by all users of the transmission network; commercial and residential electricity bill payers pay to use the networks to consume electricity and both transmission connected and embedded generators over 100MW capacity pay to use the transmission network to export their electricity. TNUoS is calculated through various factors, but mostly based on location. In general terms, generators located closer to areas of demand pay less, with those in more remote areas paying more to transmit power onto the system. It is a system that effectively signals where areas of greatest demand are situated and incentivises generators of electricity to locate in those areas.
- 5.4.1.8 The South East remains an area of greatest demand. As a result, the Applicant's focus was to look for suitable and available land in the South East to develop a solar farm. At this point whilst scale was not a determinative factor, the scale of all solar farms determines their viability, and the larger the solar farm the more viable it becomes. The Applicants' desire, therefore, was to develop at scale if possible.
- 5.4.1.9 The next stage in the site selection process was to find substations into which a connection could be made. Generally, land close to a suitable substation costs less to connect to than one further away. Power loss also drops away the greater the distance involved – the connection infrastructure, which is funded by the developer, is also expensive and

so the desire is to locate a site in close proximity to a substation wherever possible.

- 5.4.1.10 A review of substations commenced in October 2019. The Applicant looked at over 20 substations and their ability to accept new connections, as well as whether land might be available next to or close to relevant substations. The substation that offered the greatest potential to deliver a solar farm at scale was found at Cowley in South Oxfordshire District. Initially the Applicant sought sufficient land capable of delivering at least 250MW. On the broad basis that 1ha of land could deliver 1MW electricity, a search began to find a site of approximately 250 ha, plus additional land necessary for related electrical infrastructure, access and mitigation measures.
- 5.4.1.11 The search began within a 5km radius of the Cowley substation, but revealed no suitable or available land in the immediate vicinity of it. The Applicant also looked at RAF Airfields, under-going decommissioning or partly decommissioned, including land near Brize Norton, and also approached standalone large estate sites and collections of smaller sites (note that all negotiations were under Non-Disclosure Agreements).
- 5.4.1.12 Further discussions with NGET then directed the Applicant towards searching for suitable land under or in close proximity to the 400kV line to the west of Cowley, where NGET confirmed there was capacity if a connection could be made under those lines. Given expressions of interests for connections by other renewable developers in the area, NGET also began to look at building a new substation somewhere beneath this 400kV line.
- 5.4.1.13 In February 2020 the Applicant began negotiations with a willing landowner, with significant land interests in the area; The Blenheim Estate (Blenheim). Blenheim initially offered 200 ha, but that land was approximately 15km from the 400kV line. More land was needed closer to the 400kV line, which was eventually offered by Blenheim and by another landowner in the area that NGET were contemplating building the new substation. The land packages were also relatively disjointed and required additional land areas to facilitate cabling to connect them.
- 5.4.1.14 After negotiation with many other landowners in the vicinity, the Applicant then also secured land at Denman's Farm, immediately under the 400kV line to the west of Botley. Over the next year further land became available from willing landowners.
- 5.4.1.15 At about this time the Applicant employed environmental consultants, to assist in the feasibility of delivering a solar farm at scale in this location. Refinements in the land considered suitable and that was available began to be evaluated, and a series of core principles established to guide the proposals. This included removing land that might adversely affect the Blenheim Palace World Heritage site, land in Conservation Areas, ancient woodland, or that was considered too sensitive in terms of proximity to other development, but also ensuring that the areas remaining that may be suitable for development were of sufficient size to ensure the scheme was commercially viable too. Over this time the site

continued to be evaluated and assessed, ultimately growing in size to approximately 1300ha.

5.4.1.16 In February 2021, following this feasibility and evaluation stage, a Point of Connection (PoC) application was made to National Grid for 840MW. This PoC was signed in June 2021.

5.4.1.17 Over this time, therefore, the general location, overall size, and then the precise project boundaries, have been influenced by the availability of a suitable grid connection, land ownership, commercial viability, national planning policy, and environmental constraints.

5.4.1.18 The boundaries of the Site will continue to be refined as necessary in response to known or assumed physical and environmental constraints.

5.4.1.19 The Site is therefore now considered to be a suitable location, having regard to the following:

- land availability and suitability;
- its proximity to the National Electricity Transmission System (NETS);
- Consideration of planning and environmental constraints including:
 - The effect upon the Blenheim Palace World Heritage Site;
 - its location on relatively low-lying land with the ability to minimise adverse visual effects;
 - its location avoiding in large part best and most versatile agricultural land;
 - its relatively low ecological value and ability to secure potentially significant biodiversity gains; and
 - its location beyond key landscape and environmental designations e.g. AONB, Conservation Areas, setting of heritage assets, SPA's, SAC's, SSSI's;
 - its location in an area of low flood risk.

5.4.1.20 As there is no express limit to the size of any solar site in policy terms, other than the tests set out in the suite of NPS's (which the Applicant believes can be met) and given the availability (now confirmed) of a Point of Connection (PoC) to the Grid of 840MW, and the costs of consenting and developing, the Applicant has chosen to pursue consent for the current Project and the size shown. Development of a smaller site would only be desirable or necessary if:

- the adverse environmental impact of the development of the scale envisaged outweighed the benefits that the Project can deliver;
- the land was not otherwise suitable and available to construct a solar farm;
- the Project was commercially attractive at a smaller scale; and
- there was no suitable and available grid connection at the scale planned.

- 5.4.1.21 At this stage of the preliminary environmental impact assessment process, the planning balance is judged, by the Applicant, to be acceptable for the scale of development currently proposed.
- 5.4.1.22 It is acknowledged that much of the Project lies within the Green Belt. The Applicant recognises, therefore, that very special circumstances (VSC) will be set out to explain why the Applicant is siting the development in the Green Belt. The detailed VSC case will be set out in the Planning Supporting Statement that will accompany the DCO submission.
- 5.4.1.23 Part of the VSC case rests upon availability of a suitable Grid connection and, in particular, the ability to connect to the OHL and to Cowley substation. Other factors include the temporary nature of the development (the land being able to revert back to its previous use), availability of land, as well as the urgent need for renewable energy development of this type, as supported by current and emerging Government policy (outlined above).

Site Layout

- 5.4.1.24 At an early stage of the feasibility of the development of the Project, the Applicant produced a high-level constraints plan to understand site sensitivities in planning and environmental terms. This provided a framework within which the Applicant could start to consider ways in which the site could be designed and laid out that minimised or avoided conflict with these constraints.
- 5.4.1.25 Constraining factors that have been considered as part of the evolution of the Project layout and design included:
- proximity of sensitive receptors, including the Blenheim Palace World Heritage Site;
 - likelihood of adverse visual impacts;
 - proximity of areas of ancient woodland and existing tree and/or hedgerow boundaries;
 - watercourses and areas at a high risk of flooding; and
 - roads, railway lines and overhead power lines.
- 5.4.1.26 Buffer zones were then imposed on land adjacent to ancient woodland, within which it was decided that land would remain free from development. Further buffers were imposed to provide set back distances of a minimum 25m from residential properties.
- 5.4.1.27 In addition to the buffer zones introduced early on the layout and development of the Project, the Applicant has also altered the layout in the vicinity of the southern end of the Oxford Airfield. In response to consultation and further discussion with the owners of Oxford airport, they had safety concerns if the arrays and substation were located beneath the take-off or approach areas. As a result, it was agreed to remove an area of the solar arrays and relocate a substation, to accommodate this concern.

- 5.4.1.28 The evaluation of site constraints and opportunities presented an opportunity to provide the following:
- area for habitat enhancement, including planting of native species and opportunity to enhance existing habitat;
 - ability to enhance the landscape and provide screening for the Project;
 - provide safe and optimal access to the Site from the adjacent road network and enhance the existing network of public rights of way, through landscaping and additional footpaths where none existed before.

5.4.1.29 The EIA process has influenced the iterative design process of the Project, through the identification of environmental constraints, consideration of responses received during the consultation process, and identification of environmental effects.

5.4.1.30 Measures have been included within the Project to reduce the adverse effects on environmental receptors. The design parameters approach to accommodate emerging technology has the potential to further reduce environmental effects. Therefore, there have been a number of iterations and refinements to the layout of the Project.

5.4.1.31 The final layout for the Project will continue to evolve and be refined in response to the environmental assessment process, and as consultation and engagement continues.

Choice of Solar Array and Cable System and Route

5.4.1.32 The Applicant is a solar developer and so has pursued only solar development opportunities in the UK to date. It does not, therefore, intend to develop anything other than a solar array and associated infrastructure within the Project site.

5.4.1.33 The Project does not incorporate any battery storage. Energy generated by the Project will be despatched to the grid but stored, as required, by Battery Energy Storage Systems (BESS) that are connected to the Grid elsewhere, including the EDF 50MW BESS located at Cowley substation.

5.4.1.34 The Applicant has considered the type of solar arrays to be used in terms of scale as well as whether to use fixed or rotating frames. They have chosen to adopt a flexible approach to the overall height above ground of the solar arrays, ranging from 1.8 to 2.5m above ground level. This was to allow for the possibility of allowing sheep farming beneath the panels – the higher panel giving greater ground clearance to allow sheep to graze beneath. The landscape and visual assessment has assumed the worst case scenario of a maximum height of 2.5m as part of their modelling and assessment process. Depending on the interest shown by sheep farmers to farm sheep within the project site, the overall height of the panels could be reduced over a large area, resulting in much reduced effects.

5.4.1.35 The Applicant has also decided upon fixed arrays rather than rotating. The reason for this is largely cost, due to the size of the Project, and the

absence of significant gains to be made to offset the higher cost of rotating array option. In addition, it was considered that rotating arrays would not only broaden the impact area, but in doing so may lead to increased potential for adverse glint and glare effects which the Applicant has sought to avoid.

- 5.4.1.36 The cable system has also been the subject of evaluation in terms of its optimum route and method of laying the cables. The route has evolved over the past year but with a clear view from the outset that it should avoid or minimise its impact upon the environment. In light of this it was decided that where possible the cable route should be located within the existing highway where possible, but where it needed to cross open land then routes or route options have been selected which avoid impact on archaeologically sensitive areas, away from sensitive receptors where possible, and would be laid using a cut and cover technique.
- 5.4.1.37 However, where features were encountered along the route which were considered sensitive, or where cut and cover would be inappropriate, the Applicant has selected a horizontal directional drilling (HDD) method of cable laying. This will apply where the cable crosses the Thames in the vicinity of Swinford Bridge, the railway line, any tree hedgerow boundary and in the vicinity of several roads.