Proposed Solar PV Development

Byers Gill Solar
EN010139

8.9 Energy Generation and Design Evolution Document

Planning Act 2008

APFP Regulation 5(2)(q)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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1. Introduction

1.1. Purpose of this document

1.1.1. This document is prepared for Deadline 2 of the Examination of the Development Consent Order (DCO) application for Byers Gill Solar (the Proposed Development).

1.1.2. This document is a post-hearing note that has been prepared in response to matters discussed as the first Issue Specific Hearing (ISH1) held on 23 July 2024, and action points issued following the close of that hearing [EV3-005]. It provides clarification to the Examining Authority (ExA) and Interested Parties, in accordance with Hearing Action Point 8 and the subsequent Action Point (not numbered), on queries which relate to the policy position on alternatives and need; energy generation; site selection; the evolution of the design; and specific design features.

2. Summary of Policy Position on Need, Alternatives, the Mitigation Hierarchy and Residual Effects

2.1. Need

2.1.1. The statement of need for Byers Gill Solar (Proposed Development) is set out at part 3 of the Planning Statement [APP-163]. In overview, the Proposed Development would respond to the urgent need for new renewable energy infrastructure that is established through:

- national legislative commitments to decarbonisation (see paragraphs 3.2.3 to 3.2.8 of the Planning Statement);
- national policy (see paragraphs 3.2.24 to 3.2.32 of the Planning Statement);
- local planning policy and climate emergency declarations (see paragraphs 3.2.33 to 3.2.37 of the Planning Statement);
- national energy strategy (see paragraphs 3.2.9 to 3.2.16 of the Planning Statement); and
- UK energy market demand and security concerns (see paragraphs 3.2.17 to 3.2.23 of the Planning Statement).

2.1.2. This section will provide further detail on the need for the Proposed Development which is established by the National Policy Statements (NPSs) for energy in particular the Overarching National Policy Statement for Energy (EN-1) (NPS EN-1) and National Policy Statement for Renewable Energy Infrastructure (EN-3) (NPS EN-3).

2.1.3. It is important to note that an updated version of NPS EN-1 and NPS EN-3 were designated in January 2024. Since the Proposed Development was accepted for examination after the date of the updated NPS EN-1 and NPS EN-3 (the application for the Byers Gill DCO having been accepted for examination on 9 March 2024), it will fall to be decided in accordance with section 104 of the Planning Act 2008 (decisions in cases where national policy statement has effect). This is in contrast to the Secretary of State's recent decisions concerning Gate Burton Energy Park, Sunnica Energy Farm and Mallard Pass Solar Farm, which were all solar farms DCOs decided under section 105 of the Planning Act 2008 (decisions in cases where no national policy statement has effect). For those earlier decisions, whilst the designated NPS EN-1 and NPS EN-3 were in place and some regard may have been had to them, they did not "have effect" for the purposes of decision-making under the Planning Act 2008. Solar generation was not expressly included within the scope and coverage of the earlier versions of the NPS (designated in 2011) which would have had effect for the Secretary of State's decision-making for those earlier projects.

2.1.4. The Byers Gill Solar DCO application is therefore being examined, and will be determined, in a new legal and national policy context, compared to previous decisions taken on comparable schemes.

2.1.5. The following paragraphs of NPS EN-1 establish a need for the Proposed Development:

- Paragraph 3.2.6: "The Secretary of State should assess all applications for development consent for the types of infrastructure covered by this NPS on the basis that the government has demonstrated that there is a need for those types of infrastructure which is urgent, as described for each of them in this Part."
- Paragraph 3.2.7: "In addition, the Secretary of State has determined that substantial weight should be given to this need when considering applications for development consent under the Planning Act 2008."
- Paragraph 3.2.8: "The Secretary of State is not required to consider separately the specific contribution of any individual project to satisfying the need established in this NPS."
- Paragraph 4.1.3: "Given the level and urgency of need for infrastructure of the types covered by the energy NPSs set out in Part 3 of this NPS, the Secretary of State will start with a presumption in favour of granting consent to applications for energy NSIPs. That presumption applies unless any more specific and relevant policies set out in the relevant NPSs clearly indicate that consent should be refused."
- Paragraph 4.2.6: "The overarching need case for each type of energy infrastructure and the substantial weight which should be given to this need in assessing applications, as set out in paragraphs 3.2.6 to 3.2.8 of EN-1, is the starting point for all assessments of energy infrastructure applications."

2.1.6. Consequently, it is clear from paragraph 4.2.6 that the starting point for all assessments of energy infrastructure applications is the overarching need case for each type of energy infrastructure and the substantial weight which should be given to this need in assessing applications, as set out in paragraphs 3.2.6 to 3.2.8. Applying paragraphs 3.2.6 to 3.2.8, the Proposed Development should be assessed on the basis that the government has demonstrated an urgent need for such infrastructure, substantial weight should be given to this need and there is no requirement to consider the Proposed Development's specific contribution to satisfying the need. Moreover, paragraph 4.1.3 confirms that there should be a presumption in favour of granting consent for the Proposed Development. Taken together, there is an urgent need for energy infrastructure, which provides a clear and unequivocal need case for the Proposed Development.

2.1.7. In addition to the urgent need for nationally significant energy infrastructure, NPS EN-1 also provides that "Government has therefore concluded that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure." (see paragraph 4.2.4 NPS EN-1). The definition of low carbon infrastructure is set out at paragraph 4.2.5 of NPS EN-1 and would encompass the Proposed Development as a form of onshore electricity generation that does not involve fossil fuel combustion. Therefore, the Proposed Development will benefit from CNP policies. It is acknowledged that paragraph 4.2.7 of NPS EN-1 provides that CNP policy does not

create an additional or cumulative need case or weighting to that outlined for each type of energy infrastructure. However, the CNP is relevant to consideration of any residual impacts which may result from nationally significant energy infrastructure, as is set out in further detail below.

2.1.8. As set out in NPS EN-3 paragraph 2.10.9, the Government has committed to a sustained growth in solar capacity to ensure that we are on a pathway that allows us to meet net zero emissions by 2050. It states that solar is a 'key part' of the Government's strategy for low-cost decarbonisation of the energy sector, whilst paragraphs 2.10.10-121 further assert the role of solar in delivering Government strategy for energy security.

2.2. Alternatives

2.2.1. Paragraphs 5.2.10 to 5.2.17 of the Planning Statement detail the policy position in relation to site selection and consideration of alternatives for the Proposed Development. Paragraph 5.2.10 of the Planning Statement confirms that there is no general requirement within the NPSs to consider alternatives or establish whether the proposed development is the best option. It refers to paragraph 4.3.9 of NPS EN-1 which provides "*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.*"

2.2.2. Whilst it is acknowledged by RWE (the Applicant) that there are various legal or policy requirements which can trigger a requirement to consider alternatives, those are limited in respect of the Proposed Development:

- As detailed in Environmental Statement Chapter 3 Alternatives and Design Iteration [APP-126], there is a requirement under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 that the Environmental Statement must 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.*" Alternatives to the limited compulsory acquisition of land are considered in part 5.5 of the Statement of Reasons [APP-014].
- Whether it is possible to site the Proposed Development in a lower area of flood risk in accordance with the Sequential Test by virtue of the small areas of land within the Order Limits within Flood Zones 2 and 3. That is addressed in the updated Flood Risk Assessment which is being submitted by the Applicant at Deadline 2 – with the previous iteration of the Flood Risk Assessment being [AS-001].

2.2.3. There is otherwise no policy requirement in the Energy NPSs which is triggered by the Proposed Development which might require an assessment of alternatives.

2.2.4. Paragraphs 4.3.18 to 4.3.29 of EN-1 provide guidance on how alternatives should be taken account of during decision-making on applications for development consent. Paragraph 4.3.22 makes it clear that the consideration of alternatives should be done in a proportionate manner. Paragraph 4.3.24 states that: "*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 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.*" The effect of the policies on alternatives in EN-1 mean that there is **no** obligation to show that the Proposed Development represents the **best** option from a policy perspective.

2.2.5. A recent decision which illustrates this policy is the Secretary of State's decision on the Sunnica Energy Farm DCO (2024). In this example, IPs raised an alternative proposal to the project which would have removed several land parcels from the order limits and would have reduced the project's installed capacity by almost 50% (see paragraphs 4.11 and 4.12 of the Secretary of State's decision letter). The Secretary of State considered that the alternative proposal was materially different to the one applied for by the applicant and restated the position that "*except where required by law, there is no general policy requirement to consider alternatives or to establish that the development applied for is the best option*". Ultimately, the Secretary of State determined that the proposal was not a reasonable alternative and did not consider it to be a relevant planning issue.

2.2.6. The overall approach to alternatives which has been taken by the Applicant in this case is consistent with the approach demonstrated in the application documents for the Secretary of State's decisions in July 2024 concerning Gate Burton Energy Park, Sunnica Energy Farm and Mallard Pass Solar Farm.

2.3. The mitigation hierarchy

2.3.1. The Applicant has sought during the development of the project to avoid, reduce or mitigate the effects of the Proposed Development wherever it has been possible to do so, without prejudicing the ability of the Proposed Development to meet the urgent need for new renewable energy generating infrastructure.

2.3.2. It is acknowledged that paragraphs 4.2.10 and 4.2.11 of NPS EN-1 require the Applicant to apply the mitigation hierarchy and other legal and regulatory requirements. The Applicant must demonstrate that the mitigation hierarchy has been applied. The primary places that the Examining Authority can see how that mitigation hierarchy has been applied is in the following locations:

- ES Chapter 3 Alternatives and Design Iteration [APP-026]
- ES Technical Chapters:
  - Chapter 5 Climate Change [APP-028]
  - Chapter 6 Biodiversity [APP-029]
  - Chapter 7 Landscape and Visual [APP-030]
  - Chapter 8 Cultural Heritage and Archaeology [APP-031]

  - Chapter 9 Land Use and Socioeconomics [APP-032]
  - Chapter 10 Hydrology and Flood Risk [APP-033]
  - Chapter 11 Noise and Vibration [APP-034]
  - Chapter 12 Traffic and Transport [APP-035]
- The Design Approach Document [AS-004]
- The suite of management plans to be implemented during construction, operation and decommissioning:
- Outline Construction Environmental Management Plan (CEMP) [APP-110]
- Outline Decommissioning Environmental Management Plan (DEMP) [APP-111]
- Outline Construction Traffic Management Plan (CTMP) [APP-112]
- Outline Pollution and Spillage Response Plan [APP-113]
- Outline Materials Management Plan (MMP) [APP-114]
- Outline Site Waste Management Plan (SWMP) [APP-115]
- Outline Soil Resources Management Plan (SRMP) [APP-116]
- Archaeological Management Strategy (AMS) [APP-149]
- Outline Battery Fire Safety Management Plan (BFSMP) [APP-117]
- Outline Landscape and Ecological Management Plan (LEMP) [APP-118]
- Outline Public Rights of Way (PRoW) Management Plan [APP-119]
- Arboricultural Impact Assessment (AIA) [APP-138]
- Mitigation Route Map [APP-171]

2.3.3. Additional detail regarding design decisions which have been made by the Applicant are provided in the following sections of this note.

2.4. Residual effects

2.4.1. Despite the rigorous application of the mitigation hierarchy, the Applicant acknowledges that the Proposed Development may cause some significant residual adverse effects.

2.4.2. In outline, these significant residual adverse effects are reported in ES Chapter 14 Summary [APP-037] as:

Construction

- Adverse landscape and visual effects during construction*, relating to:
  - Changes to views PRoW within 1km – Between A167, Salters Lane, Lea Hall and Little Ketton Farm
- Changes to views from ProW within 1km – East of Salters Lane between Lea Hall, Newton Ketton, Elstob Lane and Hill House Lane
- Changes to views from ProW within 1km – East of Elstob Lane and Hill House Lane, between Bleach House Bank, Stoney Flatt Farm and Gillyflatts

- Changes to views from PRoW within 1km - East of Bleach House Bank between Stillington, Redmarshall and Stoney Flatt Farm
- Adverse noise and vibration arising from construction activities

Operation

- Adverse effect of temporary loss of land for agricultural production
- Adverse effect of disturbance of soil resources
- Adverse landscape and visual effects during operation relating to:
- Changes to character of LCA Darlington 6: Great Stainton Farmland
- Changes to character of Great Stainton
- Changes to character of Bishopton
- Changes to views at Great Stainton
- Changes to views at Bishopton
- Changes to views from PRoW within 1km - Between A167, Salters Lane, Lea Hall and Little Ketton Farm
- Changes to views from PRoW within 1km - East of Salters Lane between Lea Hall, Newton Ketton, Elstob Lane and Hill House Lane
- Changes to views from PRoW within 1km - East of Elstob Lane and Hill House Lane, between Bleach House Bank, Stoney Flatt Farm and Gillyflatts
- Changes to views from PRoW within 1km - East of Bleach House Bank between Stillington, Redmarshall and Stoney Flatt Farm

Decommissioning

- Adverse landscape and visual effect at decommissioning relating to Changes to views from PRoW within 1km - Between A167, Salters Lane, Lea Hall and Little Ketton Farm
- Adverse noise and vibration effects during decommissioning activities

*note that significant residual adverse effects relating to the on-road cable route at Bishopton, as reported in ES Chapter 14 Table 14-1 are no longer relevant due to the removal of this option; this is clarified in ES and Management Plans Errata (Document Reference 8.11) submitted at Deadline 2.

2.4.3. ES Chapter 14 Summary [APP-037] also identifies a significant beneficial effect during operation, from the production of low carbon energy, as well as a significant beneficial effect following decommissioning of improved soil health and return of land to agricultural production.

2.4.4. Paragraph 5.10.13 of NPS EN-1 indicates that all proposed energy infrastructure is likely to have visual effects for many receptors around proposed sites. Notwithstanding this, the Applicant has followed the mitigation hierarchy and has sought to reduce these effects as far as is reasonably possible, as set out in section 4.6 of the Design

Approach Document [AS-004]. It is also reflected in the information provided in Section 4 of this document, relating to the design evolution and how decisions were made in order to avoid or reduce potential adverse impacts on the environment. The design principles underpinning this process are also set out in the Design Approach Document [AS-004].

2.4.5. Additionally, it is important to note that the residual effects of the Proposed Development are temporary; some are limited to the operational life of the Proposed Development (of 40 years) whilst others will occur only during the construction period which is expected to be no more than 24 months.

2.4.6. In terms of policy relating to residual effects, the following sections of NPS EN-1 are relevant:

- Paragraph 3.3.63: "Subject to any legal requirements, the urgent need for CNP Infrastructure to achieving our energy objectives, together with the national security, economic, commercial, and net zero benefits, will in general outweigh any other residual impacts not capable of being addressed by application of the mitigation hierarchy. Government strongly supports the delivery of CNP Infrastructure and it should be progressed as quickly as possible."
- Paragraph 4.1.7 "Where this NPS or the relevant technology specific NPSs require an applicant to mitigate a particular impact as far as possible, but the Secretary of State considers that there would still be residual adverse effects after the implementation of such mitigation measures, the Secretary of State should weigh those residual effects against the benefits of the proposed development. For projects which qualify as CNP Infrastructure, it is likely that the need case will outweigh the residual effects in all but the most exceptional cases. This presumption, however, does not apply to residual impacts which present an unacceptable risk to, or interference with, human health and public safety, defence, irreplaceable habitats or unacceptable risk to the achievement of net zero. Further, the same exception applies to this presumption for residual impacts which present an unacceptable risk to, or unacceptable interference offshore to navigation, or onshore to flood and coastal erosion risk."
- Paragraph 4.2.15: "Where residual non-HRA or non-MCZ impacts remain after the mitigation hierarchy has been applied, these residual impacts are unlikely to outweigh the urgent need for this type of infrastructure. Therefore, in all but the most exceptional circumstances, it is unlikely that consent will be refused on the basis of these residual impacts. The exception to this presumption of consent are residual impacts onshore and offshore which present an unacceptable risk to, or unacceptable interference with, human health and public safety, defence, irreplaceable habitats or unacceptable risk to the achievement of net zero. Further, the same exception applies to this presumption for residual impacts which present an unacceptable risk to, or unacceptable interference offshore to navigation, or onshore to flood and coastal erosion risk."

2.4.7. As stated above, the Proposed Development constitutes CNP Infrastructure and so benefits from CNP policy. The Applicant has followed the mitigation hierarchy and has mitigated the significant adverse effects of the Proposed Development so far as reasonably possible, without prejudicing the ability of the Proposed Development to meet the urgent need for new renewable energy generating infrastructure.

2.4.8. Therefore, applying the CNP policy listed above, it is only in exceptional circumstances that an application for a Nationally Significant Infrastructure Project for CNP should be refused on the basis of residual impacts. Paragraph 3.3.63 of NPS EN-1 indicates that any residual impacts should be outweighed by the urgent need for the Proposed Development, as CNP infrastructure, and the benefits such infrastructure brings to national security, economic, commercial, and net zero.

3. Energy generation and design evolution

3.1. Energy generation calculations

3.1.1. This section of the report responds to the Hearing Action Points [EV3-005] for the Applicant to provide further detail on *'calculations demonstrating the expected generating capacity of the Proposed Development*.' NPS EN-3 states that: *"Along with associated infrastructure, a solar farm requires between 2 to 4 acres for each MW of output. A typical 50MW solar farm will consist of around 100,000 to 150,000 panels and cover between 125 to 200 acres. However, this will vary significantly depending on the site, with some being larger and some being smaller. This is also expected to change over time as the technology continues to evolve to become more efficient. Nevertheless, this scale of development will inevitably have impacts, particularly if sited in rural areas"*

3.1.2. Solar panels generate electricity from the sun in Direct Current (DC) electricity. Generating capacity is often referred to in terms of megawatt peak (MWp). Inverters convert the DC electricity from the solar panels to Alternating Current (AC) which is used by the national grid.

3.1.3. NPS EN-3 refers to MW output, which should be measured in MWp or DC in the calculation to establish per-acre generation. On the basis of the below calculations, the parameters Proposed Development are proportionately comparable with the typical 50MW solar farm included in EN-3.

3.1.4. The total acreage area of the Proposed Development as 1,211 acres, which is the total land within the Order Limits. The acreage of the panelled areas (measured as within the fence surrounding panelled areas, which would also include supporting infrastructure such as access tracks, inverters, transformers and BESS which are in addition to the area needed for generation) is 739 acres. The ratio of the panelled areas of the Proposed Development to its DC generation is therefore as follows:

739 acres / 288MWp = 2.5 Acres/MW DC

3.1.5. The Proposed Development is therefore directly comparable with the parameters suggested by EN-3.

3.1.6. Once fully operational, the Proposed Development would be capable of generating enough electricity to meet the average (mean) annual domestic energy needs of 75,043 typical UK homes. Solar energy generation is calculated using the formula below:

[AC MW] x [24 hours] x [365 days] x [Capacity Factor] / [Annual Average (mean) domestic consumption for the UK]

3.1.7. The capacity factor is derived from the design of the solar farm and the total megawatt hour (MWh) per year that will be produced. The proposed solar farm could produce

263,872 MWh per annum resulting in a capacity factor of 16.7% [calculated as: 263,872 / (365*24*180)].

180 x 24 x 365 x 16.7% / 3.509 = 75,043 typical UK homes

3.1.8. The generating capacity for the proposed development has been designed to meet the Grid Connection Agreement with Northern Power Grid to export 180 MW AC of electricity to the National Grid at Norton Substation.

3.1.9. From an early stage, the land assembly sought to include enough land in the project to ensure that this grid connection can be maximised across the lifetime of the solar farm.

3.1.10. In order to achieve this, enough land was sought to deliver the required DC output of the solar panels to maximise the use of the 180MW AC connection. This included land to meet the overplanting requirements of the site as set out in footnote 92 of NPS EN-3. Overplanting is required as part of the Proposed Development to as a result of the following factors:

- Degradation in panel array efficiency over time ('wear and tear');
- Power losses from transporting electricity and the increasing or decreasing of voltage levels;
- Power losses from converting the DC electricity which solar panels generate to AC electricity which is safe to export to the grid; and
- Times of low irradiation, especially at the beginning and end of each day and throughout the seasons of the year.

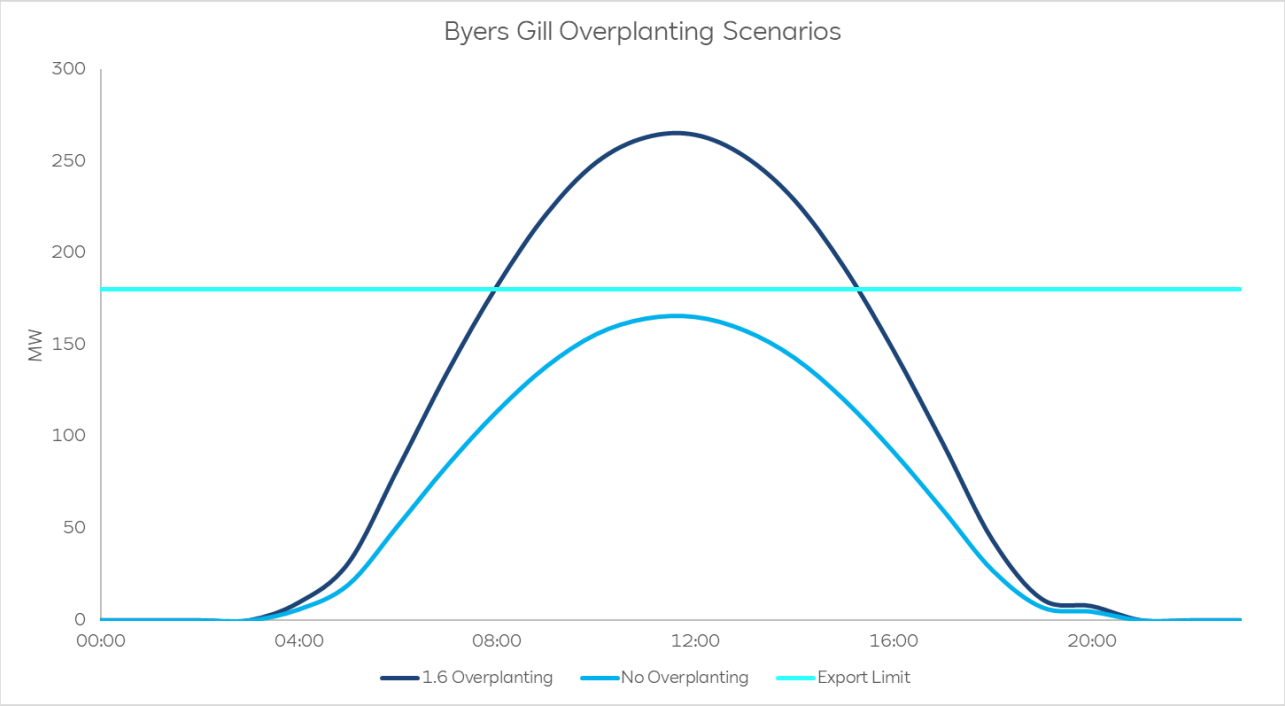
3.1.11. A ratio of 1.6 overplanting is appropriate for solar farms using fixed panels when considering these factors. The amount of electricity that can be converted to alternating current and exported to the National Grid is controlled by the inverters and limited to 180MWac. If electricity is produced that cannot be exported to the National Grid, this would be stored in the Battery Energy Storage Systems.

3.1.12. Figure 1 below shows the energy that would be produced by a 180MW DC installed capacity which would represent 1.0 overplanting (that is, a number of panels where the maximum generation is 180MW in DC and equivalent to the 180AC Grid Connection) compared to the proposed 288MW DC (1.6 overplanting). It demonstrates that the Proposed Development will deliver renewable energy and store the excess on an ideal day compared to a 1.0 overplanting ratio.

3.1.13. The majority of days are not "ideal" and thus this level of overplanting is required to ensure the Proposed Development generates enough energy to deliver the export capacity, for example in winter months. The proposed co-location of the BESS means that the excess energy is stored prior to being limited by the grid connection capacity. The stored energy can then be released to the grid when there is available export capacity.

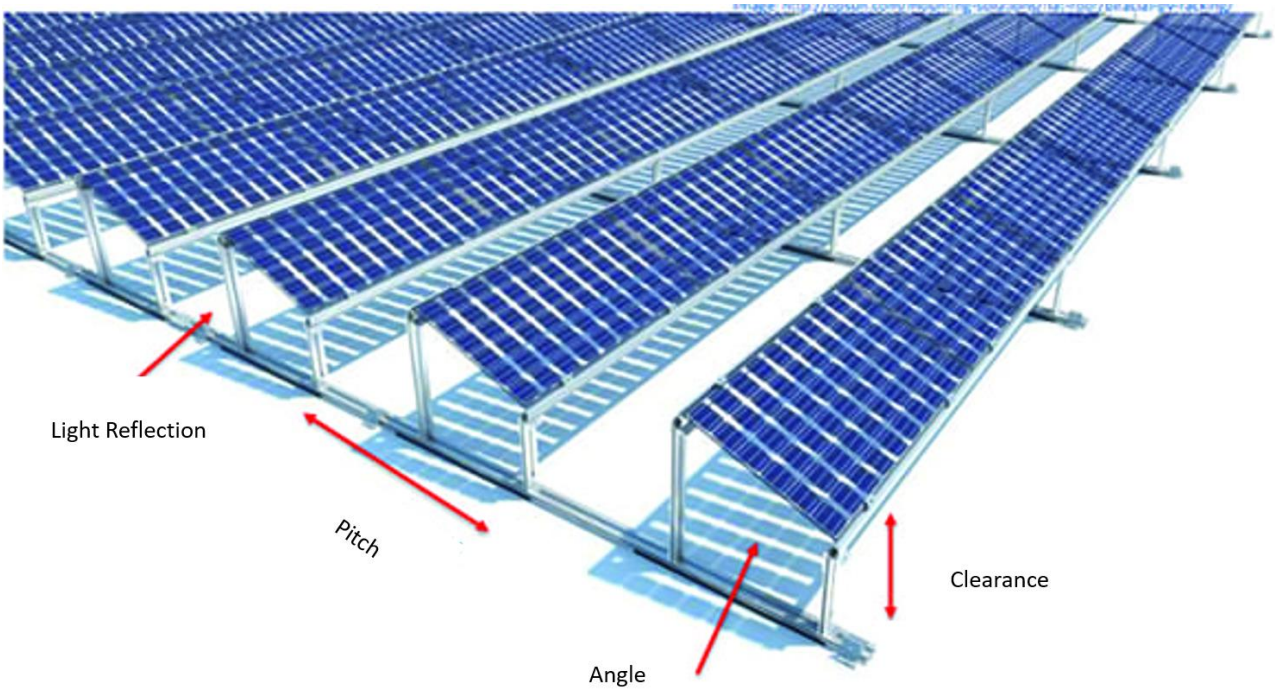
3.1.14. As shown in the diagram below, the 1.0 overplanting scenario doesn't reach the export capacity even on an "ideal" day across the life of the scheme due to the factors in paragraph 3.1.10, meaning there would be no excess energy to be stored in the BESS.

Figure 1 Byers Gill Solar Energy Generation calculations and need for overplanting



3.1.15. Other factors that are considered in establishing the ability of the solar farm to generate the required DC output to maximise the 180MW AC Grid Connection include:

- The pitch, or distance from back of one solar panel row to the back of the next. This defines the inter-row spacing that has been described in the application documents. Generally, a greater pitch will result in a higher yield as it primarily reduces shading effects on energy generation by reducing the amount of shade one panel row might cause on the next row. A greater pitch also allows more electricity to be generated from the bi-facial panels from light reflected from the ground, and aids in keeping panels at a cooler more optimum temperature.
- The angle of the solar panels – a shallower angle would be able to accommodate a greater number of panels mounted on a frame while not exceeding the proposed height of the development. However, steeper angles are more efficient for generating electricity. Therefore, while it could be desirable to accommodate a greater number of panels by utilising a shallower angle, the loss of generation by doing so may increase the number of panels and rows required.



3.1.16. In the case of the Proposed Development, design iterations were modelled to inform design progression and understand throughout the process whether there was sufficient land to deliver grid export capacity. The pitch and angle of the panels in each design iteration were designed to maximise the generation of electricity from the land available at the time. Whilst further information is provided in Chapter 4 on the reasons for each design iteration (e.g. land, environmental constraints), the following are the key iterations in terms of the design evolution as it relates to generating capacity:

- September 2022: Scoping Opinion design freeze.

  This design had optimised the use of the available land in terms of pitch and panel angle following the removal of panel areas prior to the EIA Scoping Report submission (as explained in Chapter 4 of this document). This design was based on the use of tracker panels.

- February 2023: Statutory Consultation Design.

  This design was based on tracker panels with a lower pitch than the September 2022 Scoping Opinion design to match the available land area. It also had a lower DC output following the removal of panel areas prior to statutory consultation (as explained in Chapter 4 of this document). Further modelling subsequently demonstrated that the use of tracker panels would not be preferable given the reduced amount of land available and expected yield from the solar farm, especially given levels of irradiance where the Proposed Development is located in the north of England and when compared to the increased cost of this technology.

- October 2023: DCO Submission.

  This design was updated following the removal of more panel areas in response to feedback from the statutory consultation, environmental considerations and landowner engagement (as explained in Chapter 4 of this document). A further

redesign was necessary to ensure the Proposed Development continues to meet available export capacity to the grid, albeit within a reduced land area. The output of the proposed design is 288MW DC using fixed panels, which represents a 1.6 overplanting ratio.

3.2. Summary

3.2.1. In terms of generating capacity, the size of the Proposed Development has been reduced to the smallest possible land area whilst still being able to maximise the use of the secured grid connection export capacity across its operational lifetime, meeting the critical national priority to generate solar energy.

4. Design evolution

4.1. Context

4.1.1. Under Agenda Item 3 of ISH1, the Applicant presented a description of the Proposed Development and how its design and layout was developed iteratively [REP1-006]. This included a description of the removal of some panel areas during design development. The ExA asked the Applicant to provide more information in writing as to the reasons why some panel areas were removed from the design in the period prior to submission of the application.

4.1.2. This Chapter provides further information on that matter.

4.2. Initial land assembly and option selection

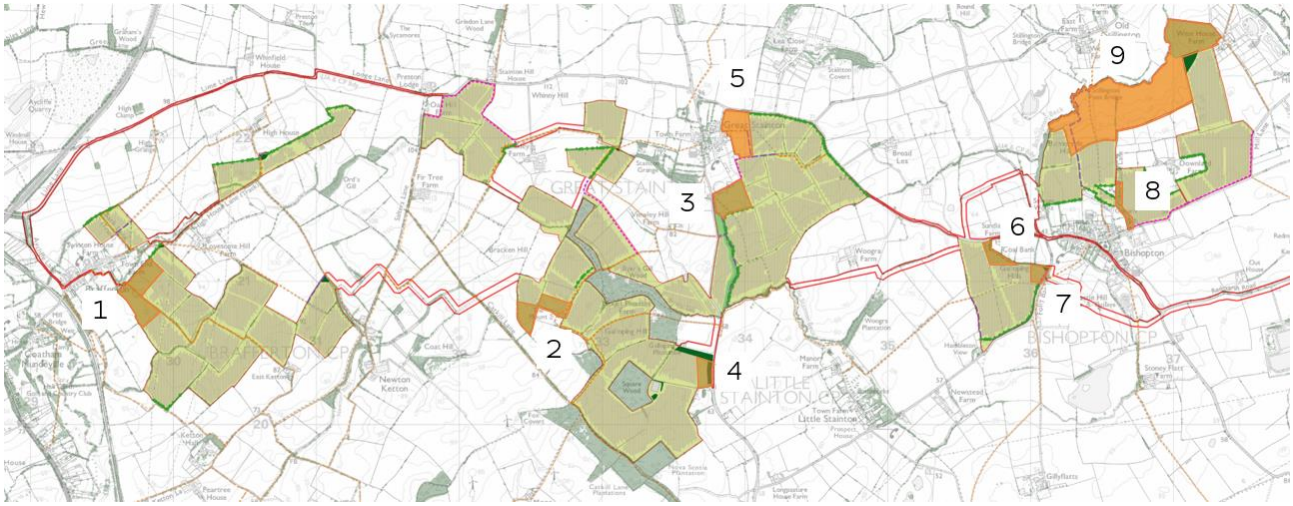
4.2.1. Section 3.6 of ES Chapter 3 Alternatives and Design Iteration [APP-026] sets out how the location and initial extent of the Proposed Development was identified, taking into account grid connection location and export capacity, irradiance, environmental and planning constraints, and land assembly (securing of voluntary agreement). With these considerations in mind, the Applicant developed the initial panel area layout and location of the on-site substation by introducing setbacks from communities and properties, and taking into account local topography and utility searches. The initial Order Limits and layout evolved in response to feedback. These design changes, and the reasons for their evolution, are set out below.

4.3. Comparative analysis

Changes made prior to EIA Scoping Report and Statutory Consultation

4.3.1. Figure 2 shows panel areas that were removed (shaded orange) from the initial layout of the Proposed Development a) prior to the submission of the EIA Scoping Report and b) prior to the statutory consultation.

Figure 2 Panel area changes made prior to EIA Scoping Report and statutory consultation



4.3.2. The table below explains why these panel areas were removed.

Table 4-1 Reasons for removal of panel areas prior to the submission of the EIA Scoping Report and prior to the statutory consultation

Panel Removed No.	Stage	Reason for removing panel areas
1	Pre-scoping report	In response to early landscape and visual advice regarding the character and landscape setting of Brafferton. To increase the available mitigation land for habitats.
2	Pre-scoping report	Proximity to the Newton Ketton Meadow SSSI.
3	Pre-scoping report	In response to early landscape and visual advice regarding views from and the character and landscape setting of Great Stainton.
4	Pre-scoping report	In response to early landscape and visual advice regarding residential visual amenity of Carr House and views from local road south of Great Stainton.
5	Pre-scoping report	In response to early landscape and visual advice regarding views from and the character and landscape setting of Great Stainton.
6	Pre-scoping report	In response to early landscape and visual advice regarding residential visual amenity of Hilltop House.
7	Pre-statutory consultation	In response to landscape and visual advice regarding views from Bishopton and comments made in October/November 2022 co-design stakeholder workshops.

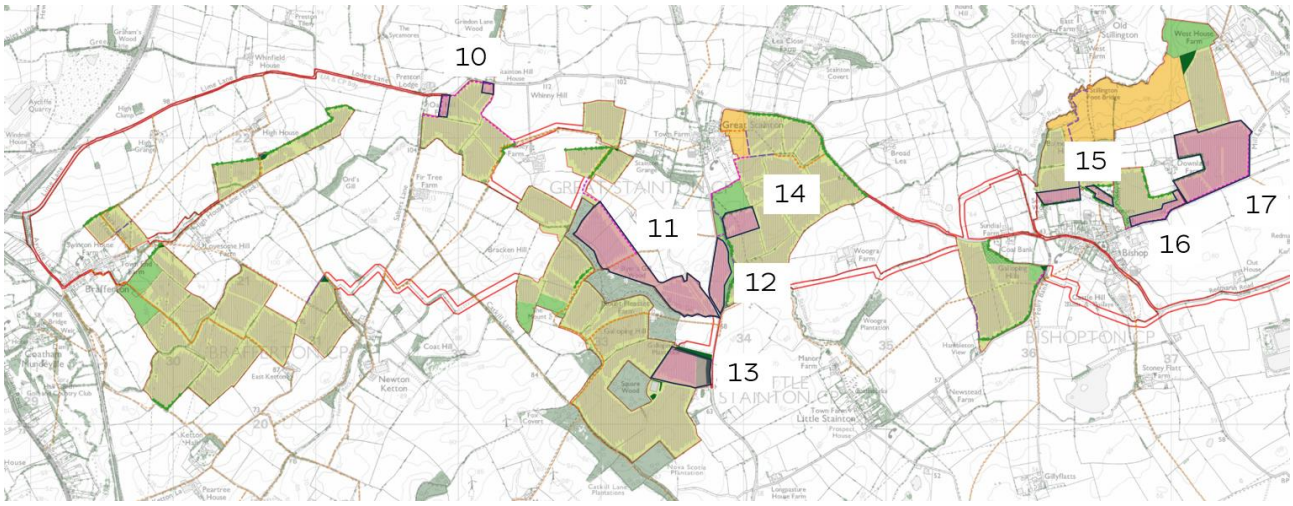
Panel Removed No.	Stage	Reason for removing panel areas
8	Pre-statutory consultation	In response to landscape and visual advice regarding views from recreation ground and residential properties (Cobby Castle Forge). Also in response to comments made concerning potential impacts on the school in October/November 2022 co-design stakeholder workshops.
9	Pre-scoping report	In response to landscape and visual advice regarding views from local road, Stillington and Old Stillington due to slopes facing northwards towards these visual receptors. Also due to lack of irradiance on north facing slopes following further design review. Retained in the red line boundary for agricultural use / potential mitigation land.

Panel Removed following statutory consultation

4.3.3. Following statutory consultation, further revisions were made to the design of the Proposed Development, taking into account feedback from the consultations, further environmental assessment and land negotiations.

4.3.4. Figure 3 shows the panel areas that were removed (shaded purple) from the Proposed Development following statutory consultation.

Figure 3 Panel area removed following statutory consultation



4.3.5. The table below explains why these panel areas were removed.

Table 4-2 Reasons for removal of panel areas post statutory consultation

Panel Removed No.	Stage	Reason for removing panel areas
10	Post statutory consultation	Two areas removed to move the panels further from the adjacent properties (Oat Hill Farm and Stainton Hill Farm) following detailed site visits.
11	Post statutory consultation	This area of land was subject to signed Heads of Terms however the full Option Agreement had not been signed at the time of consultation. It was agreed the land would be shown as part of the consultation pending an option being signed afterward. The Applicant cannot comment on whether the option would have been signed by the landowner, however it was confirmed by 31 July 2023 that it would no longer seek to include this land in the Proposed Development. Removing panels in this location was also informed by landscape and visual advice that effects would be reduced by removing panels from fields close to Elstob Lane (southern end of this group of three fields) which would be particularly visible when descending the hill from Great Stainton. There are reductions in landscape and visual effects relating to the removal of panels from the other two fields as they are elevated and sloping with wider visibility from the southeast than most of the site, but the removal of these panels was not specifically driven by the design of landscape and visual mitigation.
12	Post statutory consultation	This is the same landowner as design change 11 above. Removing panels in this location was also informed by landscape and visual advice that effects would be reduced by removing panels from fields close to Elstob Lane which would be particularly visible when descending the hill from Great Stainton. The removal of these panels was not specifically driven by the design of landscape and visual mitigation.
13	Post statutory consultation	This is the same landowner as design change 11 above. There are reductions in landscape and visual effects relating to the removal of panels from this location (for users of Elstob Lane and a nearby footpath), but the removal of these panels was not specifically advised for landscape and visual mitigation.
14	Post statutory consultation	The area without panels to the south of Great Stainton was extended further to take the panels beyond the naturally occurring ridge in order to mitigate landscape and visual effects by avoiding an area of panels which would slope towards the village.

Panel Removed No.	Stage	Reason for removing panel areas
15	Post statutory consultation	Both areas removed in response to consultation responses regarding the proximity of the panel areas to the north side of Bishopton.
16	Post statutory consultation	Area removed in response to consultation responses regarding the proximity of the panels to Mill Lane and the local importance of Mill Lane as a recreational route; and subsequent landscape and visual advice regarding the mitigation of effects on recreational users of Mill Lane.
17	Post statutory consultation	This is the same landowner as design change 11 above. The removal of this area of panels provided mitigation for several impacts. Changes had been advised to mitigate landscape and visual and residential amenity impacts relating to the recreational use of Mill Lane (as design change 16 above) and proximity to, and views from, properties at Downland Farm. Removing this panel area also meant construction access would not be required down Mill Lane or through Bishopton, as all access is gained from the road to the west of Bishopton to get to Panel Area F.

4.4. Summary

4.4.1. This Chapter of the report has set out the reasons for the removal of each panel area land parcel between the initial design layout and the DCO application. In doing so it demonstrates that the reasons for panel removal was site specific relating to a combination of reducing/avoiding environmental effects and landowner negotiations.

4.4.2. This section of the document has responded to the Hearing Action Points [EV3-005] for the Applicant to provide further detail on *'an explanation of the previous reduction or removal of panel areas.'*

5. Design and layout of specific components

5.1.1. Following ISH 1 [REP1-006], two of the Hearing Action Points in [EV3-005] related to queries on the layout of specific components.

Noise generating equipment

5.1.2. Hearing Action Point 6 [EV3-005] requested that Mr Norman Melaney submit at Deadline 1 'in writing question for the Applicant to clarify how the 300m separation of the Battery Energy Storage Systems from residential housing has been measured (i.e whether from the residence or boundary of the residence)'

5.1.3. This question does not appear to have been submitted at Deadline 1 and therefore the Applicant cannot respond to a specific question at this time. The Applicant can confirm however that the measurement of 300m has been taken from design principles applied across all solar designs where possible. The distance of 300m is used as this is the usual maximum extent of noise effects that can arise from BESS based on the developments proposed to date.

5.1.4. The Applicant also provided clarification on this design principle within its post-hearing submissions [REP1-006] in paragraph 3.15, which states:

> "Following discussion of the siting of BESS in the hearing, the Applicant has reviewed the design and has identified that there is one location in which BESS is less than 300m from a residential property. This is in Panel Area F, where a BESS was initially designed to be 300m from properties, however it was moved away from Mill Lane in response to concerns raised about this location, and is now within 300m of a residential properties at Cobby Castle Lane and Downland Farm. This has been assessed in respect of operational noise within the Environmental Statement and does not result in any significant adverse effect to the receptors. This is reported in ES Chapter 11 Noise and Vibration [APP -034] and depicted in ES Figure 11.8 Noise Contours Across Area F [APP-098] . The Applicant acknowledges that the wording of the design principle relating to the 300m minimum distance of BESS from properties, as secured via the Design Approach Document (DAD) [AS -004] therefore requires rewording to accurately refer to BESS -inverter hybrid containers (rather than inverters) and to make clear that a minimum distance of 300m from BESS -inverter hybrid containers is applied where possible. This will be updated in a revised version of the DAD to be submitted at a later Examination deadline."

5.1.5. The Applicant can respond to a question from Mr Melaney once submitted, if the above does not sufficiently address the query.

5.2. Layout of spare containers

5.2.1. The un-numbered Hearing Action Point [EV3-005] requests that the Applicant explain 'the potential to consolidate the maintenance equipment for the Proposed Development to a single onsite location.'

5.2.2. Smaller items such as panels, small amounts of cables, MC4s (connectors between PV modules) etc will be stored on site – likely in use every few months to replace the odd panel or damaged cabling etc. Larger items such as replacement panels would be ordered as required and delivered to the site from a centralised location; it is expected this would be very infrequent.

5.2.3. It would be inefficient to consolidate storage off-site as this would increase the number of trips and size of vehicle required to carry out maintenance activities. The total number of storage containers across the site is proportionate to the size of each panel area and the requirements for storage.