



Hilfield Solar Farm and Battery Storage

Environmental Statement
on behalf of Elstree Green Limited

Prepared by Aardvark EM Limited | December 2020 |
Document Reference: R007

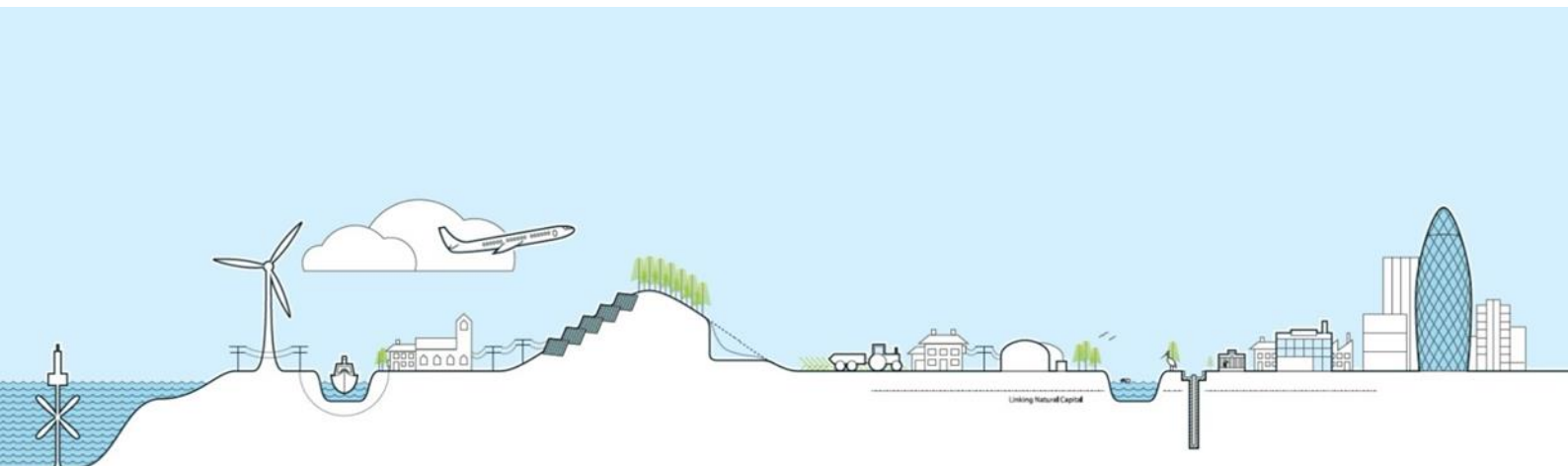


ENVIRONMENTAL STATEMENT

Accompanying a planning application for the construction and operation of a grid-connected solar photovoltaic farm with battery storage, other ancillary infrastructure, access, landscaping and biodiversity enhancements on Land to the North East and West of Elstree Aerodrome, Hertfordshire

DECEMBER 2020

Prepared By



Project Quality Control Sheet

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Signature			
Date	18/12/2020	18/12/2020	18/12/2020
Company	Aardvark EM Ltd	Aardvark EM Ltd	Aardvark EM Ltd

Location: Land to the North East and West of Elstree Aerodrome, Hertfordshire

Grid Reference: TQ 15093 96697 (centre of application site)

Project Manager: Nicholas Leaney

Report Authors: Nicholas Leaney
Rachel Ness

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Report Written and Produced By

Aardvark EM Limited, Higher Ford, Wiveliscombe, Taunton, Somerset, TA4 2RL

Telephone: 01984 624989, Facsimile: 01984 623912

Email: environment@aardvarkem.co.uk, Web: www.aardvarkem.co.uk

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Appendix 1 EIA Screening and Scoping Opinion Letter

Appendix 2 EIA Project Team Qualifications and Experience

Appendix 3 Glint and Glare Assessement

1 Introduction

1. The Environmental Statement has been prepared by Aardvark EM on behalf of Elstree Green Limited (“the Applicant”) to accompany a full planning application to Hertsmere Borough Council (HBC) for the construction, operation and decommissioning of a grid connected solar farm with battery storage and associated infrastructure (“the Proposed Development”) on Land to the North East and West of Elstree Aerodrome, Hertfordshire (“the Site”). The development will provide a reliable source of clean renewable energy which will be supplied to domestic and commercial consumers via the national grid network.
2. The Proposed Development would supply up to 49.9MW to the National Grid, providing the equivalent annual electrical needs of approximately 15,600 family homes in Hertsmere. The anticipated CO₂ displacement is around 25,400 tonnes per annum, which represents an emission saving equivalent of a reduction in c.8,100 cars on the road every year. It is also estimated the solar farm will increase the total amount of renewable electricity generated in Hertsmere from 5.4% to 20%, bringing Hertsmere closer to the national average of 33% electricity generated from renewable sources
3. The battery storage facility would be utilised to reinforce the power generation of the solar farm. Storing energy at times of low demand and releasing to the grid in periods of higher demand or when solar irradiance is lower, as well as providing balancing services to maintain National Grid stability.
4. There is an urgent requirement for renewable energy generation which the Proposed Development would help fulfil; whilst being suitable to the Site and its surroundings; according with national and local planning policy and relevant material planning considerations; and delivering significant biodiversity benefits.
5. In accordance with the validation requirements of HBC, this report sets out the planning policy context relating to the benefits and acceptability of the principle of the Proposed Development assessed against the design principles and concepts that have been applied and how environmental issues relating to the proposed scheme have been addressed.
6. Whilst the Environmental Statement is set out to be read as a standalone document, it should be read in the context of the entire submission documentation in order to fully understand the Proposed Development, its potential impacts and planning merits.

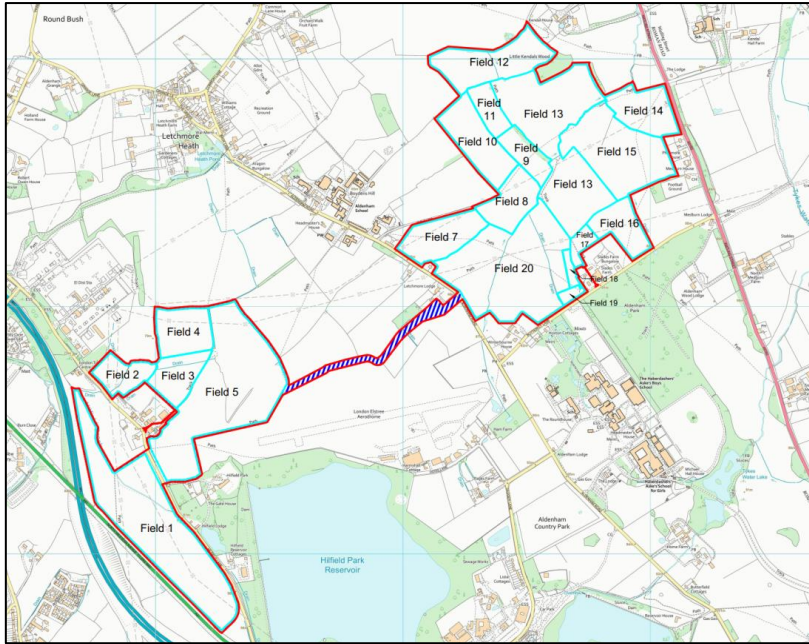


Figure 1: The Application Site

1.1 The Applicant

7. Elstree Green Limited is a wholly owned subsidiary of Enso Green Holdings Ltd, a joint-venture partnership between Enso Energy and Macquarie's Green Investment Group (GIG).
8. Enso Energy is one of the UK's leading developers of energy projects, having delivered in excess of 1GW of distributed generation to date. GIG is a global leader in renewable energy development and investment, with a European base out of London.
9. GIG is responsible for delivering renewable energy generation totalling 493,000GWh of electricity and has investment and operations in over 25 markets, more than 400 staff and £20 billion of capital committed or arranged to support green energy projects.
10. For more information please visit the Applicant's web site on the Proposed Development, the benefits of solar energy and other projects <https://www.ensoenergy.co.uk>.

1.2 Environmental Impact Assessment Regulations and Process

11. The process of EIA in the context of town and country planning in England is governed by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the "2017 Regulations"). These regulations apply to the development which is given planning permission under Part III of the Town and Country Planning Act 1990.
12. An Environmental Statement is a document that sets out the findings of an EIA. An EIA is a process for identifying the likely significance of environmental effects (beneficial or adverse) arising from a proposed development, by comparing the existing environmental conditions prior to development (the baseline) with the environmental conditions during/following the construction, operational and/or decommissioning phases of a development should it proceed.
13. In order to determine if it is necessary to undertake an EIA to accompany a planning application, Regulation 5 of the 2017 Regulations makes provision for an applicant to apply to an LPA for a "Screening Opinion".

1.1.1 Screening

14. “Screening” is a procedure used to determine whether a proposed project is likely to have significant effects on the environment. The 2017 Regulations contain two development schedules, Schedule 1 development and Schedule 2 development.
15. Schedule 1 contains a list of development where EIA is mandatory. Schedule 2 contains a list of development, along with development thresholds, where EIA may be needed. The LPA must screen every planning application falling within the Schedule 2 development thresholds to determine whether EIA is required.
16. The Proposed Development is not a Schedule 1 development and does not automatically require an EIA under the 2017 Regulations.
17. It does however constitute a project where EIA maybe necessary under Schedule 2 an industrial installation for the production of electricity whereby the threshold to undertake screening is when the site area exceeds 0.5 hectares.
18. An Environmental Impact Assessment (EIA) Screening Request in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) for a proposed solar farm and battery storage facility on the Site was submitted by the Applicant to HBC on 4 August 2020 (ref. 2017-R001). This provided details of the baseline condition, the proposed approach to the assessment and the likely potential effects arising from the Proposed Development.
19. A response was received on 10 September 2020 (20/1183/EI1) from HBC confirming an Environmental Statement would be required under the Town & Country Planning (Environmental Impact Assessment) Regulations 2017.
20. A copy of the EIA Screening letter issued on 29 September 2020 is provided in Appendix 1.

1.1.2 Scoping

21. “Scoping” is a procedure used to determine the extent of environmental issues to be considered in the EIA and reported in the ES.
22. HBC confirmed in their Screening Opinion, that the only topic that would be required to be addressed within the Environmental Statement was Aviation Safety impacts relating to the safe operation of Elstree Aerodrome.
23. In addition, the following topics were scoped out of the ES but are submitted as standalone assessments with the application;
 - Landscape and Visual Impact
 - Flood Risk Assessment
 - Agricultural Land Classification
 - Traffic
 - Heritage
 - Biodiversity
 - Ground Investigation
24. The EIA Screening and Scoping Opinion has informed the preparation of this ES and the other accompany documents to the Application

1.3 Structure of the Environmental Statement

25. The ES comprises technical studies on each of the aspects of the environment identified by HBC as likely to be significantly affected by the Proposed Development.
26. The aim of the EIA is to protect the environment by ensuring the LPA, when deciding whether to grant planning permission for a project, does so in the full knowledge of the likely significant effects and takes this into account in the decision-making process.
27. The ES is structured as follow:
 - Environmental Statement Main Report (Volume 1): this comprises the main volume of the ES, including “general chapters” that describe the EIA context, describe the Site and Proposed Development, and set out the scope of the ES, followed by “technical chapters” for each environmental theme with the associated figures concluding with a summary. It is Document Ref: R007;
 - Environmental Statement Technical Appendices (Volume 2): this comprises the technical appendices supporting the Main Report. This is Document Ref: R008; and
 - Environmental Statement Non-Technical Summary (NTS): this provides a concise summary of the ES identifying the significance of the likely effects and measures proposed to mitigate or to avoid adverse effects of the Proposed Development. This is Document Ref: R006.
28. The content of the ES Main Report comprises:
 - **Chapter 1 Introduction** which presents a brief summary of the Proposed Development, the Applicant and Study Team, the EIA process to date;
 - **Chapter 2 The Site and Its Environs** which provides a summary of the Site’s features and characteristics together with those of the surrounding area;
 - **Chapter 3 The Proposed Development** which describes the proposed solar farm and battery storage facility, including the ancillary infrastructure and proposed landscaping a biodiversity provisions. It also outlines any alternatives considered in the course of preparing the planning application;
 - **Chapter 4 Climate Change, Energy, Planning Policy and Guidance** which provides a summary of the relevant policy context against which the Proposed Development needs to be considered;
 - **Chapter 5 Assessment Methodology** which provides a description of the methodology used in undertaking the EIA for the Proposed Development;
 - **Chapters 6 Aviation Safety Assessment** which provides a description of the findings of the EIA process

Chapter 6 includes:

 - An explanation of the relevant legislation, policy, guidance and standards for that topic;
 - A summary of the consultation responses from the Scoping Opinion and other consultations and how these have been taken into account;
 - A brief explanation of the assessment methodology and significance criteria used;
 - A description of the baseline conditions and receptors;

- A summary of topic specific mitigation embedded in the Proposed Development;
 - The findings of the assessment of the likely significant environmental effects of the Proposed Development after incorporating embedded mitigation;
 - The findings of the assessment of the cumulative effects of the Proposed Development in combination with other plans or submitted/consented projects;
 - An explanation of what further mitigation may be appropriate in order to minimise significant adverse effects;
 - The findings of the assessment of the residual significant environmental effects of the Proposed Development after further mitigation has been applied;
 - A description of any monitoring requirements; and
 - A description of any further work required and summary of residual effects.
- **Chapters 7 Summary of other considerations**
 - **Chapter 8 Glossary of terms used in the ES**

1.4 The EIA Consultant Team

29. The 2017 Regulations require EIA applications to be accompanied by confirmation that the ES has been prepared by competent experts. Appendix 2 identifies the environmental consultants who have prepared the ES and their relevant expertise.

1.5 Other Documents

30. Several other documents have been submitted to the LPA as part of, and accompanying, the Application. These are summarised below, including with reference to the ES documents for the sake of completeness:

Document	Author	Reference
Covering Letter, Application Form and Certificates	Aardvark EM Limited	R001
Planning Application Drawing Pack	Aardvark EM Limited and Blueleaf	R002
Planning Statement	Aardvark EM Limited	R003
Design and Access Statement	Aardvark EM Limited	R004
Construction Traffic Management Plan	Transport Planning Associates	R005
Non-Technical Summary of the Environmental Statement	Aardvark EM Limited and Pager Power Limited	R006
Environmental Statement Main Text	Aardvark EM Limited and Pager Power Limited	R007
Environmental Statement Technical Appendices	Aardvark EM Limited and Pager Power Limited	R008
Landscape and Ecological Management Plan	LDA Design and BSG Ecology	R009

Document	Author	Reference
Flood Risk Assessment and Drainage Strategy	RMA Environmental	R010
Noise Impact Assessment	Inacoustic	R011
Glint and Glare Assessment	Pager Power Limited	R012
Ecological Impact Assessment Report (including Biodiversity Net Gain Statement)	BSG Ecology	R013
Statement of Community Involvement	Alpaca Communications	R014
Agricultural Land Classification	Askew Land and Soil Limited	R015
Ground Investigation Assessment	R M Cameron Environmental Services Ltd	R016
Heritage Desk Based Assessment	Headland Archaeology	R017
Landscape and Visual Impact Assessment	LDA Design	R018

Table 1: Application and Accompanying Documents

1.6 Environmental Statement Availability and Comments

31. This ES has been submitted to HBC as the Local Planning Authority. It may be inspected at the Council during normal office hours subject to any restrictions that may be in place as a result of the COVID19 pandemic:
Planning & Economic Development
Hertsmere Borough Council
Civic Offices
Elstree Way
Borehamwood
Herts
WD6 1WA
32. The ES and other planning application documents are also available to view on both the Council's website (Online Planning Register) and the Applicant's website <https://www.ensoenergy.co.uk>
33. Alternatively, copies of the ES may be obtained from Aardvark EM at the following address:
Aardvark EM Limited
Higher Ford
Wiveliscombe
Somerset
TA4 2RL
Telephone: 01984 624989
34. The purchase costs are:
 - Main Report and Technical Appendices - £150.00

- Non-Technical Summary - £5.00
 - Digital copies of the above documents on a CD - £20.00
35. Comments on the Application should be forwarded to HBC during their consideration and determination of the planning application.

2 The Site and Its Environs

2.1 Introduction

36. The Site has been subdivided into two main parcels and the fields within the Site are referred to as Fields 1 to 20 as shown on Figure 2 below.
- The western parcel (grid reference: TQ151965 (centre of parcel)) and comprises Field 1 to 5.
 - The eastern parcel (grid reference: TQ165975 (centre of parcel)) and comprises Field 7 to 20 (field 6 was removed from the scheme during the design process).

2.2 Site Context

37. The red line indicates the extent of the Proposed Development area which is contiguous with the land under the control of the Applicant. Overall, the red line application site area comprising the grid connection cable route between the two land parcels and twenty adjoining arable fields as shown on Figure 2 below totals an area of approximately 130 hectares. Excluding the grid connection cable route between the two parcels, the Site totals an area of approximately 128 hectares.

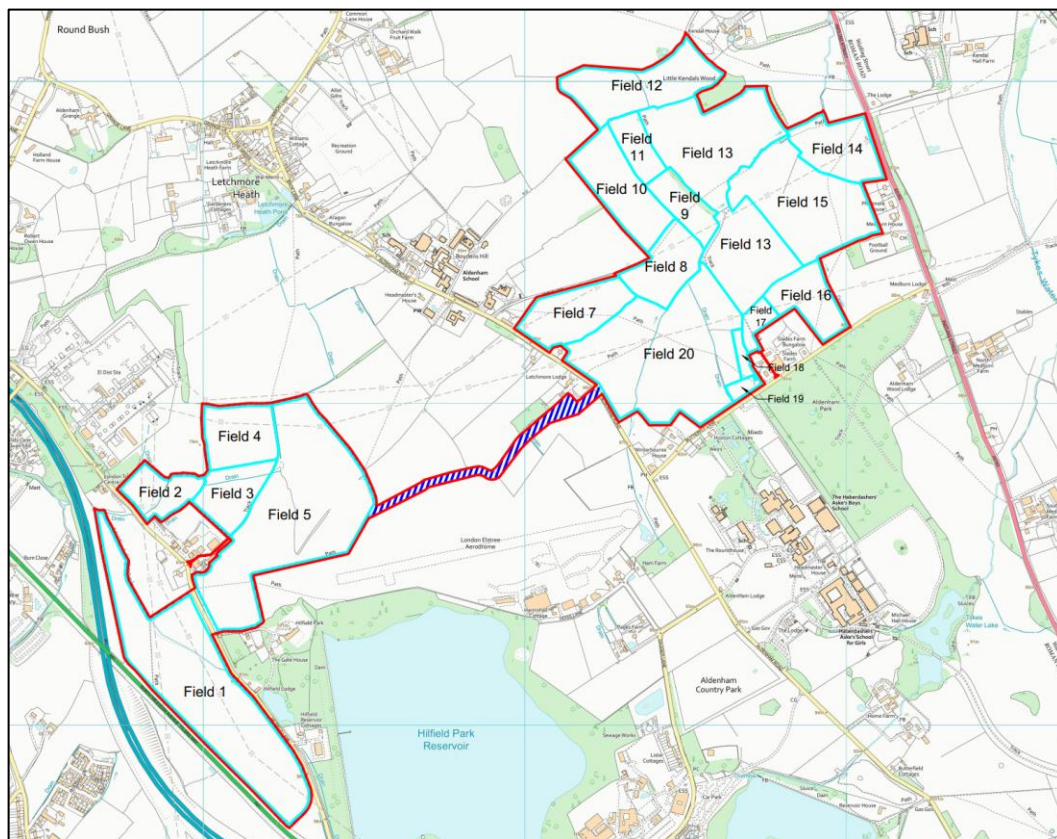


Figure 2: Existing Site Location Plan (see Document Ref: R002 for scale drawing)

38. The Site is located approximately 3km east of Watford and approximately 2km west of Borehamwood and sits within an agricultural landscape, surrounded by energy and transport infrastructure, including the adjacent Elstree Aerodrome and major transport corridors of the M1 and A41. The Hilfield Reservoir lies approximately 100m east of Field 1 (western parcel) and Aldenham Reservoir lies approximately 1km to the south of Field 20 (eastern parcel). The

Midland Main Line railway is located to the east, approximately 660m from the Proposed Development at its closest point.

39. The Site is located wholly within the London Metropolitan Green Belt (LMGB). The Hertsmere Borough Council Local Plan Core Strategy (2013) identifies that 80% of the borough falls within the Green Belt, with the four main settlements of Borehamwood, Bushey, Potters Bar and Radlett constituting the only urbanised areas in the borough.
40. The Site is located in a semi-suburban setting, with localised intrusion of man-made features areas, including the Elstree Aerodrome, adjacent to the southern boundary of the western parcel; Aldenham Road, which separates the two parcels; Hilfield Lane, which intersects the western parcel; the M1, which lies approximately 50m west of the western parcel (Field 1); and the A41 (North Western Avenue), which lies adjacent to the southwestern boundary of Field 1; Butterfly Lane and Watling Street, which lie adjacent to the southern and eastern boundary of the eastern parcel (Fields 7 and 20), respectively; properties and schools along Aldenham Road; overhead power lines, which cross over the Site; and the 400kV Elstree Substation which is located within approximately 100m to the northwest of the western parcel (Fields 2 and 4).
41. The settlements within the wider context of the Site include Letchmore Heath, Round Bush and Radlett to the north; Bushey to the southwest, and Borehamwood to the east.

2.3 Description

42. The Site is mainly rural in character with some localised intrusion of man-made features. There are no statutory landscape, heritage or ecological designations within the Site.
43. The Site is accessed via Hilfield Road and Butterfly Lane. The Site wholly comprises Subgrade 3b agricultural land, as identified by the Agricultural Land Classification (ALC), which is not classified as Best and Most Versatile (BMV) agricultural land.
44. The Site has been subject to 'historical landfilling activity' which is recorded in the southwestern and western areas of the eastern Site parcel (Fields 17, 18, 19 and 20). It is likely that landfilling activity took place pre-1974.
45. The Site is predominantly located in the Parish Council area of Aldenham, the western parcel doesn't fall within a parish but the whole Site is within the administrative area of HBC.
46. The field network within the Site is characterised by hedgerows, hedgerow trees and woodland. The Site is gently undulating ranging between approximately 100 – 80m above ordnance datum (AOD). The western parcel rises to its highest elevation in the western area of the parcel (Field 5), at approximately 100m AOD and slopes in a general northwesterly direction to approximately 80m AOD in Field 2. The eastern parcel rises to its highest elevation in the southern area in Fields 18 and 19, at approximately 90m AOD and slopes in general northeasterly direction to approximately 80m AOD in Fields 13, 14 and 15.
47. Hilfield Brook flows partly along the boundary of, and through, Field 1, in a northwesterly direction, and a series of drains route into Fields, 2, 3 and 5. A series of drains also flow through the eastern parcel, from a watercourse which routes though the parcel in a northeasterly direction, which forms part of the Tykes Water and Borehamwood Brook, approximately 700m northeast of the eastern parcel. There are approximately six ponds within the Site and a further two immediately adjacent to the site boundary.
48. In terms of Public Rights of Way (PRoW), Restricted Byways Bushey 36 and 38 route through Fields 1 and 5 on a general east-west alignment, from the A41 to the Elstree Aerodrome site,

continuing as Bridleways Bushey 53 and Aldenham 78. Restricted Byway Bushey 46 routes from Bridleway Bushey 53 in a northerly direction and continues north as Footpath Aldenham 14, both of which form the eastern boundary of Field 5. Footpath Aldenham 30 routes from Footpath Aldenham 14 on northeast-southwest alignment, forming the eastern boundaries of Fields 3 and 4. Footpath Aldenham 30 eventually joins Restricted Byway Bishey 38 in the southwestern area of Field 5. Footpath Aldenham 40 routes through Fields 6, 7, 8, 9, 13, 15 and 14 (eastern parcel) between Watling Street and Aldenham Road on a general east-west alignment. From Footpath Aldenham 40, Footpath Aldenham 42 routes on a on a northwest-southeast direction toward Butterfly Lane through Fields 7, 20, 18 and 19. Footpath Aldenham 44 routes toward Butterfly Lane northeast-southwest alignment through Field 14, 15 and 16. Footpath Aldenham 43 routes through Field 20, parallel to the south of Footpath Aldenham 40, from Aldenham Road to the west, eventually adjoining Footpath Aldenham 42 to the east. Footpath Aldenham 32 routes along the eastern boundaries of Fields 9 and 11 and continues along the northern boundaries of Fields 11 and 10. Footpath Aldenham 31 routes along part of the northern boundary of Field 12 in the northernmost extent of the Site, and routes in a general northeast-southwest direction between Watling Street to the east and Footpath Aldenham 17 to the north.

2.4 Designations

49. There are no statutory landscape, heritage or ecological designations within the Site (see Table 2 below).
- The Site is located within the LMGB the purposes of which are to¹:
 - to check the unrestricted sprawl of large built-up areas;
 - to prevent neighbouring towns merging into one another;
 - to assist in safeguarding the countryside from encroachment;
 - to preserve the setting and special character of historic towns; and
 - to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

Environmental Designation	Distance	Search Results
National Parks	5km	0
Area of Outstanding Natural Beauty	5km	0
World Heritage Sites	5km	0
Scheduled Monuments	1km	1
Conservation Areas	1km	2
Grade I Listed Buildings	1km	0
Grade II* Listed Buildings	1km	3
Grade II Listed Buildings	1km	38

¹ Hertsmere Borough Council (2017) Green Belt Assessment Report (Stage 1)

Environmental Designation	Distance	Search Results
Registered Parks and Gardens	1km	1
Registered Battlefields	1km	0
Ramsar Sites	5km	0
Special Protection Areas	5km	0
Special Area of Conservation	5-10km	0
National Nature Reserve	5km	0
Site of Special Scientific Interest	5km	0
Local Wildlife Sites	2km	35
Local Nature Reserves	2km	2

Table 2: Designations

3 The Proposed Development

3.1 Introduction

50. The planning application seeks permission for the following Proposed Development:
51. “Installation of renewable led energy generating station comprising ground-mounted photovoltaic solar arrays and battery-based electricity storage containers together with substation, inverter/transformer stations, site accesses, internal access tracks, security measures, access gates, other ancillary infrastructure, landscaping and biodiversity enhancements.”
52. It is made up of the following main components that work together to generate and store renewable energy:
- Solar panels that convert sunlight to electrical energy. The bifacial panels are ground mounted on frames and produce solar power from both the top and bottom sides of the panel. This is the best available technology;
 - 16 inverter/transformer stations spread evenly across the Site and which convert the captured solar energy into electricity capable of being fed via underground cables into a new on-site substation. From here it is then exported to the National Grid, again via an underground cable; and
 - 20 battery storage containers also located next to the on-site substation that store the solar produced electricity in times of lower demand so that it can then be released into the National Grid when demand is higher.
53. The full details of the Proposed Development are illustrated in the Planning Application Drawing Pack (Document Ref: R002) which contains the following drawings as summarised in Table 3 below:

Drawing No	Plan Name
HF1.0	Location Plan
HF2.0	Proposed Site Plan – General Arrangement Drawing
HF3.0	PV Elevations
HF4.0	Inverter Transformer Stations
HF5.0	Internal Access Road Elevations
HF6.0	Fence and Gate Elevations
HF7.0	Weather Station Detail
HF8.0	Substation Elevations
HF9.0	Control Room Elevations
HF10.0	Auxiliary Transformer

Drawing No	Plan Name
HF11.0	CCTV Elevations
HF12.0	Battery Container Elevations 40ft
HF13.0	Storage Container Elevations
7533-012	Landscape and Ecological Enhancement Plan (LEEP)
HF14.0	Field Topographical Data East
HF15.0	Field Topographical Data West

Table 3: Planning Application Drawings

3.2 The Proposed Development

54. A summary of the main elements of the Proposed Development is set out below and explained in more detail in the Design and Access Statement (DAS) (Document Ref R004):
- Bifacial Solar photovoltaic (PV) panels, ground mounted onto a Fixed Tilt system. Uses a south-facing system at a tilt of 15-30 degrees mounted on a sub structure;
 - 16 inverter/transformer stations distributed evenly across the solar farm;
 - String combiner boxes to combine multiple strings of PV panels;
 - Approximately 20 battery storage containers;
 - Compacted crushed stone internal tracks, rolled in layers to allow vehicular access to the substation and between fields;
 - 2.2m high security deer type fencing and gates to enclose the parameters of the Site and allow sheep to graze securely;
 - Security and monitoring CCTV/infra-red cameras mounted on fence posts along the perimeter of the Site;
 - Pole mounted weather stations and monitoring containerised building;
 - Underground and cable tray cabling to connect the panels, inverters and battery storage to the proposed on-site substation;
 - A security-fenced enclosed substation compound;
 - Underground cable connecting the on-site sub-station to Elstree Substation to the west of the site;
 - Site access; and
 - Landscaping planting, biodiversity enhancements and surface water attenuation measures.
55. Solar panels would be laid out in rows with gaps of approximately 2-6m between each row. Panels are mounted on a frame made of galvanized steel or aluminium. The metal framework that supports the solar panels would be fixed into the ground by posts centred c. 6m apart. The posts would be pile-driven (like a fence post) into the turf to a depth of around 2-2.5m. This approach means no concrete is needed to secure the system and the posts can be easily

removed. At their lower edge panels would be approximately 0.8m from the ground and up to approximately 3m at their higher edge depending on the position of within the topography of the site.

56. The sixteen inverter/transformer stations are housed within green metal containers each measuring 12m x 2.4m x 2.9m. The same container type is used to house the battery storage units which are not stacked and is located next to the proposed on-site substation. The substation would measure 12.5m x 5.5m x 4.2m and would be sited on hard core or a concrete slab.
57. All cabling between the solar panels and the inverter/transformer stations and the on-site substation would be in relatively shallow underground trenches. To keep the development secure and prevent criminal damage deer fencing c. 2.2 m high would be installed together with CCTV and/or infra-red cameras to provide 24-hour surveillance. The cameras would be inward facing only on poles up to 2.5–3m high. No permanent operational or security lighting is proposed within the site.
58. No permanent operational lighting is proposed at the Site. Manually operated lights may be attached to the substation and inverter/transformer stations in the event of an emergency maintenance visit being required in the hours of darkness.

3.3 Landscape and Biodiversity Proposals

59. Landscape mitigation and biodiversity enhancement proposals have been incorporated into the scheme design as part of the iterative design process (see the Design and Access Statement (Document Ref: R004) for an explanation of the design journey), and the finalised proposals are presented in full in the Landscape and Ecological Management Plan (LEMP) (Document Ref: R009).
60. The key landscape and biodiversity proposals are listed below:
 - Significantly enhance the overall biodiversity value of the Site;
 - A biodiversity net gain of 39.54% for habitats and 23.3% net gain for hedgerows;
 - The proposed PV panels will be confined to the existing individual fields parcels to ensure a well-integrated scheme is implemented that causes minimal loss of existing vegetation on Site;
 - Facilitate opportunities for engagement with the natural environment and renewable energy;
 - Protect and enhance the existing characteristics and features of value of the Site including the field structure, mature trees, hedgerows, watercourses and ditches;
 - Create a strong structural planting framework and protect, restore and maintain the existing vegetation network, which would also provide enhanced screening of close- and middle-distance views to the Proposed Development;
 - Create greater opportunities for protected species' and species of conservation concern;
 - Protect and enhance recreational amenity from PRoW; and
 - The potential for low intensity grazing of areas between and beneath solar panels by sheep.

3.4 Public Footpaths

61. All existing PRoW within the Site will be retained and will remain open and in their present position for the duration of the construction and operational phases.
62. New planting along the routes of the PRoW and permissive footpaths will be provided to both protect and enhance their recreational amenity, and interpretation boards and way-markers will be provided to provide education opportunities. As a minimum there will be a 5m buffer from PRoW to the solar panels throughout the area away from the sheep grazing areas.

3.5 Highway Access

63. The details of the construction vehicle routes are set out in the CTMP submitted with the application (see Document Ref. R005). The design of the proposed Site access/egress is provided in the Planning Application Drawing Pack (Document Ref: R002).
64. The Site is located close to the strategic highway network, being east of the M1 Motorway and A41, south of the M25 and west of the A1. The identified routes, as set out below, are considered the most appropriate route to connect the Site to the strategic road network, avoiding all weight restrictions in the local area.
65. Construction traffic will route to the western parcel from the M1 Motorway via the following route;
 - M1 Motorway Junction 5;
 - A41 North Western Avenue;
 - Sandy Lane; and
 - Hilfield Lane.
66. Construction traffic will route to the eastern parcel from the M1 Motorway via the following route;
 - M1 Motorway Junction 5;
 - A41 North Western Avenue;
 - Dagger Lane;
 - Aldenham Road; and
 - Butterfly Lane.
67. The details of the construction vehicle routes have been discussed with officers at Hertsmere Borough Council (HBC) and Hertfordshire County Council (HCC) and are considered, subject to management of delivery times to be the most appropriate for use by construction vehicles and are discussed in more detail within the CTMP .

3.5.1 Construction Access and routing

68. The designated route for all construction vehicles associated with the construction period is shown in in the CTMP. Visitors, delivery drivers and contractors will be advised of the route in advance of driving to the Site.
69. The designated route requires all construction vehicles to access the Site from the identified construction access points on Hilfield Lane and Butterfly Lane using existing agricultural access junctions.

- 70. The proposed construction vehicle routes are a direct route straight from the strategic highway network to the Site
- 71. The use of any other roads other than the designated and signposted route shall not be permitted and this shall be enforced through the agreement of the CTMP.
- 72. Appropriate mitigation measures will be provided throughout the construction phase in order to manage the arrival and departures of HGVs at the Site.

3.5.2 General Site and Maintenance Access

- 73. Solar farms require little maintenance, with activity limited to occasional visits to clean (using only distilled water), check and conduct preventative maintenance on the installation, with personnel using small vehicles (4x4 or transit van type). Use of larger vehicles may be required if necessary to replace any defective components, should any equipment fail during the lifetime of the farm.
- 74. There will be two points of Operational Access via Hilfield Lane to the west (through Hilfield Farm) and Butterfly lane to the east (through Slades Farm).

3.6 Operational Lifespan and Decommissioning

- 75. The Proposed Development would export renewable energy directly to the National Grid for a period of 35 years.
- 76. The battery storage element is also expected to operate for a minimum of 35 years. The solar and battery elements could either be delivered independently of each other or at the same time. They could therefore be constructed and become operational either independently or at the same time.
- 77. At the end of the useful life of the Project, the Applicant may decommission, replace or refit the modules, or if required to by condition following a period of 12 months of non-continuous generation. An appropriate method statement based on the preferred option for decommissioning will be prepared and submitted to the Council for their consideration and agreement.
- 78. The proposed scheme including the penetrative ground fixings are fully reversible and all structures can be removed from the site and the land reinstated to agricultural use. Many of the component parts, including the aluminium framework and silicon in the module panels, can be recycled for other uses. Should the modules be decommissioned, this will be undertaken within six months of notice given to the Council and is anticipated to follow the construction stages in reverse. Reinstatement will occur at each stage of the decommissioning and all waste removed from site to a suitably licensed facility.
- 79. Vehicle movements are anticipated to be the same as per the construction period.

3.7 Construction

- 80. It is anticipated that the construction phase will last for approximately 40 weeks.
- 81. Two points of Construction Access are proposed via Hilfield Lane to the west for fields 1 to 5 and the substation/battery energy storage compound (through Hilfield Farm) and from Butterfly Lane to the east (through Slades Farm) for fields 7 to 20 (field 6 has been removed from the scheme).

82. Construction activities will be carried out Monday to Friday 08:00-18:00 and between 08:00 and 13:30 on Saturdays. No construction activities or deliveries will occur on Sunday or Public Holidays. Where possible, construction deliveries will be coordinated to avoid construction vehicle movements during the traditional peak hours. As there are several schools in the area, deliveries will be coordinated during term time and weekdays to avoid drop of and pick up times, between 07:30-09:00 and 15:00-18.00. As such, all deliveries during these periods will be made between 09:00-15:00.
83. It is anticipated that there will be 1,084 deliveries by HGV (comprising 16.5m articulated and 10m rigid vehicles) including construction traffic associated with constructing internal access roads, general movements and other site equipment during the construction period. It is expected that there will be an average of around seven HGVs per day accessing the Site over the construction period (14 two-way movements).
84. Approximately 60 to 70 construction workers are anticipated to be required on-site during peak construction. The location where staff will travel from is unknown at this stage as it will depend on the appointed contractor. However, it is envisaged that the majority of non-local workforce will stay at local accommodation and be transported to the Site by minibuses to minimise the impact on the strategic and local highway network. Notwithstanding this, appropriate car parking provision for construction workers and visitors will be provided within the contractor compounds.
85. No parking by contractors, visitors or delivery vehicles will be permitted on the local highway network or the Site access road at any time during the construction phase, and visitors will be advised of the parking arrangements in advance of travelling to the Site. The Site Manager will monitor that parking is taking place in the designated area on a regular basis.
86. No diversion of pedestrian routes, parking suspensions or closure of lanes or closure/diversion of Public Rights of Way are required. An underground cable will be installed to connect each Parcel of Land. This will need to cross Aldernham Road and Hilfield Road. Prior to these works being undertaken, all appropriate licences will be obtained, and traffic management agreed with the relevant authority.
87. Two secure temporary construction compounds (one next to the substation/battery site in the western section accessed from a temporary construction access from Hilfield Lane to service Fields 1 to 5 and the second on the eastern site where the access track enters the site from Slades Farm for Fields 7 to 20) will be used to store materials and ancillary welfare facilities during the construction period. This does not form part of the Proposed Development. In the event of the Proposed Development being granted planning permission, the compounds will be provided under associated Permitted Development rights.
88. The temporary compound(s) will likely (but not limited to) include:
- Temporary portable buildings to be used for offices, welfare and toilet facilities;
 - Containerised storage areas;
 - Parking for construction vehicles and workers vehicles;
 - Temporary hardstanding; and
 - Wheel washing facilities.
89. In addition, the Proposed Development will include internal access roads (3.5-6.0m wide) throughout the Site allowing for the movement of construction and maintenance vehicles.

90. If ground conditions dictate, wheel washing facilities and road sweepers will be provided to ensure no mud or loose material is transferred onto the local highway network. In such circumstances all construction vehicles will have to exit through the wheel wash area.
91. Further detail is contained in the accompanying CTMP (Document Ref: R005).

3.8 Alternatives

92. The consideration of alternatives can be one of the key ways in which the impact of a proposed development can be reduced, by exploring alternative avenues and their relative advantages and disadvantages for achieving the development objectives.
93. The alternatives considered as part of the Proposed Development's evolution included the site location, the scheme design, technology choice and the "do nothing" option.

3.8.1 Alternative Sites

94. Location is driven first and foremost by the need to be close to an available grid connection point, recognising that the viability of a renewable energy led project reduces the further away it is. The Elstree Substation, located adjacent to the Site, has capacity and the Applicant has secured this via a Connection Agreement.
95. On securing the connection at the Elstree Substation, a 5km radius is mapped from this Point of Connection (POC). There are commercial and practical reasons for this:
 - The further away from the POC the more must be spent on the cable, which has a significant impact on the viability of project;
 - Longer cable routes result in increased inefficiency in the scheme i.e. increased electrical losses; and
 - A longer cable route results in more disturbance, both environmentally and locally.
96. Within this search area the Applicant considers environmental and planning constraints, such as landscape designations, policy designations such as Strategic Gaps, sensitive habitats, archaeological and heritage issues etc. The Applicant also carefully considers geographical and topographical factors such as slope and aspect, shading, access etc.
97. Once potentially suitable locations have been identified the Applicant engages with the landowners in the area to ascertain their interest in being involved with a potential solar scheme. These conversations involve landowners having the ability and desire to lease their land and having sufficient area of the right type of land to host a viable development either on its own or in combination with other nearby landowners. If this exercise is successful, the Applicant can then agree to fundamental terms and engage solicitors to prepare contracts.

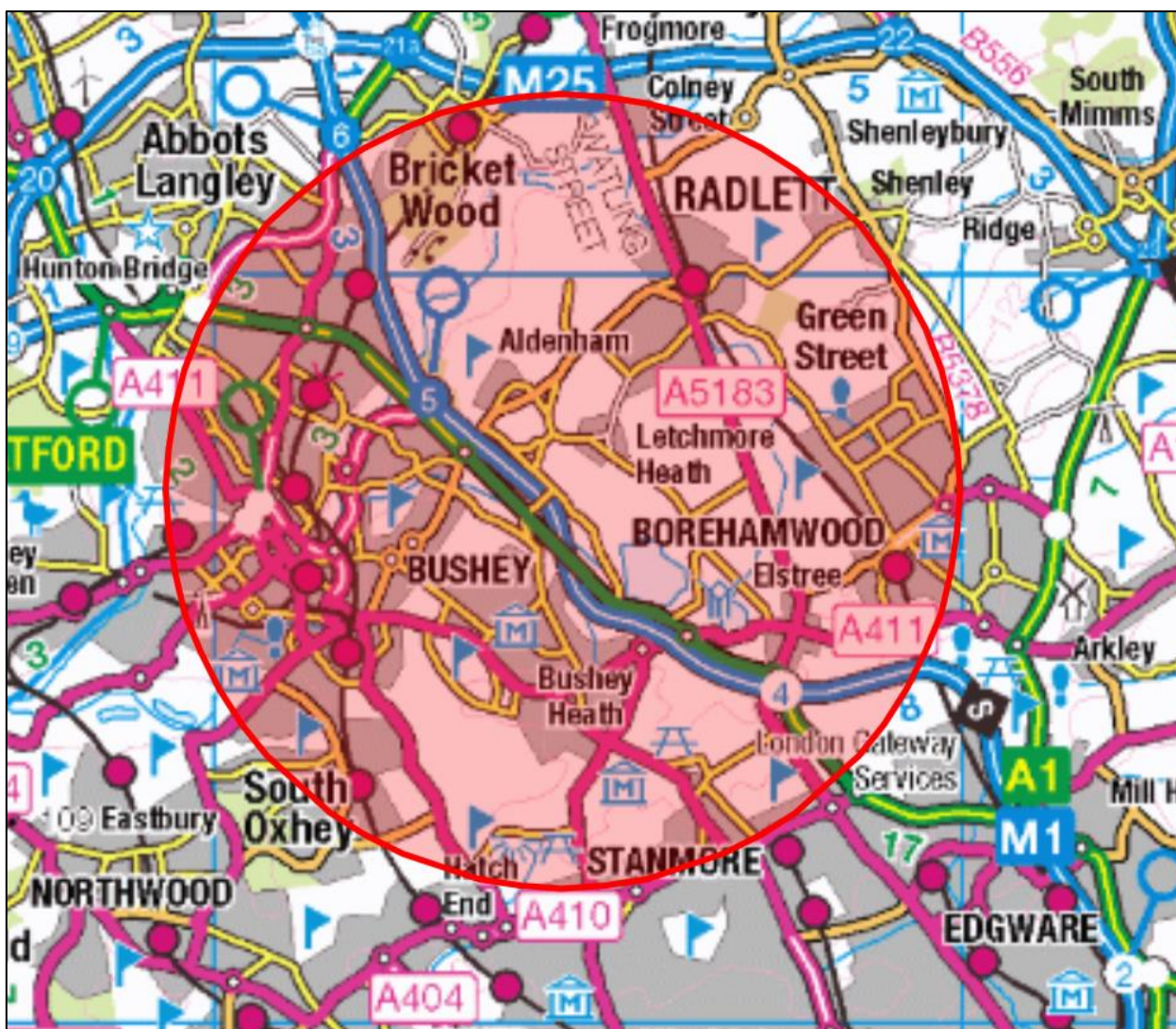


Figure 3: 5km Study Area – Elstree Substation POC (Source: Magic Maps)

98. The Applicant appointed Aardvark EM as its planning advisor to undertake an initial desk-based site sieving exercise using the following agreed exclusionary criteria (Table 4). This was undertaken in order to exclude land the failed one or more of these fundamental criteria which would essentially prevent its development as a solar farm.

Sieve	Criterion	Summary of application
1	Area of land	Minimum requirement of 120ha for tracking system or 80ha for a fixed system if there were identified constraints.
2	Existing Development	Land already developed and in active use were discounted.
3	Deliverability	Land which is allocated/safeguarded for specific land uses (i.e. housing) within the Development Plan or emerging Development Plan were discounted.
4	Topography	Land with gradients greater than 18 degrees were discounted.

5	Radiance levels	Focus on areas of higher irradiance due to the scale (driven by the connection cost) and requiring good irradiance to drive the yield.
6	European and National Nature Conservation Designations	Land containing a designated a Natura 200 or Ramsar site or Site of Special Scientific Interest were discounted.
7	Scheduled Ancient Monuments (SAM)	Land containing a SAM were discounted.
8	Protected Landscape Designations	Land located within a National Park or Area of Outstanding Natural Beauty (AONB) were discounted.

Table 4: The Eight Exclusionary Criteria

99. To ensure an accurate understanding of exclusion criteria, online mapping data such as Magic Map UK and the Local Development Plan were reviewed in the context of the 5km search area.
100. A semi-detailed ALC survey of the Site was carried out in July 2020 which determined that the quality of agricultural land at the whole Site is limited by soil wetness to Subgrade 3b (medium sensitivity receptor) and does not affect any BMV agricultural land.
101. After the exclusionary criteria had been applied the next step considered the remaining land in the search area to investigate whether it could be assembled and configured into a commercially viable solar layout.
102. The Applicant approached landowners within the search area that owned land that was not allocated for development in the Development Plan, and which avoided areas which contained the eight exclusionary criteria. If landowners declined to engage or advised they were not interested, the land was deemed to be unavailable and not pursued further.
103. Coming out of this process was the Site subject to this Application, which is considered suitable and is available for the Proposed Development.

3.8.2 Alternative Layout Designs

104. Alternative designs for the Proposed Development were considered during the scheme evolution process and the outcome of consultation with the public and advisors to the Local Planning Authority have led to numerous changes including:
 - Ensuring a suitable offset is provided between the Site's boundaries and the Proposed Development to allow for new planting and enhancement of the existing field and boundary vegetation;
 - Minimising potential impact on landscape fabric by avoiding and buffering existing landscape features such as woodland, trees, hedgerows and ditches;
 - Enhancement of existing hedgerows both within and around the periphery of the Site to aid screening and improve the landscape structure;
 - Creating buffers around PRow through the Site to maintain their recreational amenity;
 - Use of a sensitive colour pallet for built structures to aid assimilation into the landscape;

- The provision of green corridors, green wedges and nature areas by creating additional habitats to strengthen visual screening, enhance landscape character and increase biodiversity/green infrastructure including new hedgerows and linking of existing habitats within the Site;
 - Creation of new native species planting along existing routes to screen and filter close views to the Proposed Development, comprising dense linear screening planting to include lower lever shrubs and tall hedgerow trees;
 - A new permissive path around the football club pitches at the junction of Watling Street and Butterfly Lane;
 - A new permissive path linking with the Hertfordshire Way that previously wasn't possible from the internal network of PRoW across the site;
 - Siting of security fencing behind new structure planting to reduce visual impact; and
 - Implementation of interpretation boards at appropriate junctions of PRoWs within the Site, which will allow for opportunities to better understand the positive contribution the Proposed Development will make in adapting to climate change.
105. The Design and Access Statement (Document Ref: R004) details all elements of the alternative design approaches deployed in detail.

3.8.3 Alternative Renewable Energy Technologies

106. An alternative renewable energy source to solar in this location could be wind. However, several large-scale wind turbines would be necessary to generate the same amount of power as the Proposed Development and, given the site context and prevailing planning policy regarding on-shore wind, it is concluded that the preferred technology is solar arrays. Different types of solar panel systems were considered and, after site investigation and design optioneering, the bifacial panels were selected as the best available technology that would maximise the energy efficiency of the site.

3.8.4 Do Nothing Alternative

107. It is regarded as best practice within the EIA to consider the “do nothing” alternative. The “do nothing” option would entail leaving the Site in its current condition and it is assumed that the current land use would remain as it is. That is, available for agriculture. It is an obvious statement that any impacts associated with the Proposed Development would therefore not occur.
108. However, the “do nothing” option would result in the loss of a significant and urgently needed renewable energy source and storage proposed by the Proposed Development.
109. Other benefits that would not be secured are the:
- substantial biodiversity benefits;
 - the improvements to soil health; and
 - farm diversification benefits.

4 Climate Change Energy Planning Policy and Guidance

4.1 Introduction

110. In 2019 the UK Parliament declared a Climate Emergency. This declaration was in response to the Government's advisors on climate change identifying that to avoid more than a 1.5oC rise in global warming, global emissions would need to fall by c. 45% from 2010 levels by 2030, reaching net zero by 2050.
111. The declaration of the Climate Emergency confirmed the growing gravity of the global warming risk and signalled the need for urgent action to reduce greenhouse gas emissions by moving rapidly to a low carbon economy powered by delivering significant quantities of ever greater amounts of renewable and low carbon energy.
112. In May 2019 a National Climate Emergency was declared by the UK Parliament. MPs called on Government to make changes that included setting a new target of reaching net zero emissions before 2050. At a local level, the strategy and action plan for how Hertsmere Borough Council (HBC) will achieve net zero carbon emissions by 2050 was approved by Full Council on 14 October 2020. Hertsmere is one of 205 local authorities, alongside Hertfordshire County Council (HCC), St Albans City and District Council, Watford Borough Council and Dacorum Borough Council, who have declared a climate emergency and committed to taking urgent action to reduce their carbon emissions. Hertsmere approved their Climate Change and Sustainability Action Plan in 2020 and issued an interim planning policy statement in October 2020 setting out how the local development plan policies should be applied until the replacement local plan is adopted.
113. This Chapter is structured in three distinct parts. The first sets out the international and national energy and planning policy that is driving the need for additional renewable and low carbon power generation. The second part sets out the national and local planning policy (as contained in the adopted and emerging replacement development plans) which provide the basis for decision making on renewable energy infrastructure planning applications. The final part covers other relevant supplementary guidance documents.
114. The plan-led approach to development as set out in Section 38(6) of the Planning and Compulsory Purchase Act 2004, requires development proposals to accord with the adopted development plan unless material considerations indicate otherwise.
115. The Planning Statement (Document Ref: R003) provides a detailed account and assessment of the conformity and merits of the Proposed Development against these national and local policy requirements.

4.2 International Energy Policy

4.2.1 The Paris Agreement (2016)

116. The UK commitment to the reduction of greenhouse gas emissions through the ratification of the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement in November 2016. The Paris Agreement committed its signatories to *"hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels"*. The agreement also made it clear that the global economy will need to be zero-carbon by the second half of the 21st Century.

4.2.2 Renewable Energy Directive 2018/2001/EU

117. In December 2018, the EU Renewable Energy Directive 2018/2001/EU entered into force in order to help the EU meet its emissions reduction commitments under the Paris Agreement. This established a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023.
118. The decision of the UK to exit the EU casts doubt over the future application of these European targets however the UK has recently set its own more challenging legally binding targets which will drive a rapid and expanded deployment of low carbon power and renewable energy including solar.

4.3 National Energy Law and Policy

119. The objectives of the UK renewable energy policies are in accordance with the overall international and European policy objectives. These are focused on a number of key climate change challenges, which include:
- The reduction of CO₂ emissions to tackle climate change;
 - The promotion of competitive energy markets in the UK;
 - Affordability to customers; and
 - Security of decentralised energy supplies.
120. There is a significant body of international and national energy policy support for renewable and low carbon development. This support is rooted in the Government's policy of growing the economy in a decarbonising way and achieving its recently set legally binding target of net-zero greenhouse gas emissions by 2050. To help achieve this the Government is rapidly seeking to transition from a traditionally fossil fuel dependent economy to increasing amounts of secure, resilient renewable and low carbon energy, including solar power. The fact that solar technology has advanced to the point where it no longer requires public subsidy to make it commercially viable lends it further support from Government.

4.3.1 Climate Change Act 2008

121. The Climate Change Act 2008 set into legislation the UK's approach to tackling and responding to climate change. It introduced a legally binding 2050 target to reduce greenhouse gas emissions by at least 80% relative to 1990 levels
122. The two key aims of the Act are to:
- improve carbon management, helping the transition towards a low-carbon economy in the UK; and
 - demonstrate UK leadership internationally, signalling commitment to taking our share of responsibility for reducing global emissions in the context of developing international negotiations.

4.3.2 Energy Security Strategy (2012)

123. The Energy Security Strategy was published by the Department of Energy and Climate Change (DECC) in November 2012. The document sets the direction for energy security policy. It provides a clear assessment of the UK's position, the risks the country faces, and the actions that are being taken.

124. The Energy Security Strategy sets out that the Government is primarily concerned about ensuring that consumers have access to the energy services they need (physical security) at prices that avoid excessive volatility (price security). The Strategy states that the energy security must be delivered alongside achievement of our legally binding targets on carbon emissions and renewable energy. It is noted that whilst the Government cannot control world energy market prices, they are seeking to ensure that energy services are as affordable as possible, both for consumers and businesses, and in the long term to reduce dependence on imported fossil fuels.
125. The Strategy outlined that there are risks to security of supply over the medium-term, with approximately 20% of the capacity available in 2011 set to close by 2021. It outlines the importance of diversity in the supply of energy and places an emphasis on ensuring that there is resilience in the market. Paragraph 1.10 of the Strategy refers to how the country's energy requirements are likely to change between now and 2050, and states as follows:
- “Electricity use is likely to increase by at least 30 per cent and potentially by 100 per cent as much of our heating and transportation becomes electrified. We may see more seasonal demand (caused by electrification of heating) and different peaks in demand (from electric vehicles). These changes to demand patterns, alongside an increased use of renewables and nuclear (less flexible supply), will increase the challenges of balancing the system and also present opportunities to embed demand side response (DSR) and distributed capacity (e.g. night charging of electric vehicles).”*

4.3.3 UK Solar PV Strategy (2014)

126. Government policy is to substantially increase the deployment of renewable energy across the UK, including solar PV. It has published a Roadmap to a Brighter Future as the first part of a UK Solar PV Strategy. The Roadmap sets out four guiding principles, which form the basis of Government's strategy for solar PV. These principles are:
- Support for solar PV should allow cost-effective projects to proceed and to make a cost-effective contribution to UK carbon emission objectives in the context of overall energy goals – ensuring that solar PV has a role alongside other energy generation technologies in delivering carbon reductions, energy security and affordability for consumers.
 - Support for solar PV should deliver genuine carbon reductions that help meet the UK's target of 15 per cent renewable energy from final consumption by 2020 and in supporting the decarbonisation of our economy in the longer term – ensuring that all the carbon impacts of solar PV deployment are fully understood.
 - Support for solar PV should ensure proposals are appropriately sited, give proper weight to environmental considerations such as landscape and visual impact, heritage and local amenity, and provide opportunities for local communities to influence decisions that affect them.
 - Support for solar PV should assess and respond to the impacts of deployment on: grid systems balancing; grid connectivity; and financial incentives – ensuring that we address the challenges of deploying high volumes of solar PV.

4.3.4 Clean Growth Strategy (Oct 2017)

127. The Government's Clean Growth Strategy (Oct 2017) sets out how it envisages the delivery of the clean, green economic growth needed to combat global warming. It identifies the policies necessary to drive a significant acceleration in the pace of the UK's decarbonisation to achieve the 2032 carbon budget targets that in turn will keep us on track to achieve the net zero target by 2050. The Strategy recognises the potential offered by solar to grow low carbon sources of energy and the Government confirms it wants to see more investment in this sector without public subsidy.

4.3.5 UK 25 Year Environment Plan (2018)

128. The sister document to the Clean Growth Strategy is the Government's UK 25 Year Environment Plan (Jan 2018). This sets out the goals for improving the environment within a generation and the actions Government will take over the next 25 years to achieve them. It supports the shift away from coal towards cleaner forms of energy as a way of reducing air pollution; confirms that the environmental protection already enshrined in national policy will be maintained and strengthened; and, importantly, indicates the existing requirement to provide biodiversity net gains is likely to be expanded to providing a wider environmental net gain which will be consulted upon as a mandatory requirement.

4.3.6 National Infrastructure Assessment (2018)

129. In relation to the need for upgraded energy infrastructure, the National Infrastructure Assessment (2018) is highly supportive of building low cost, low carbon energy sources. The Assessment (prepared by the independent National Infrastructure Commission (NIC)), was the first of its kind in the UK and recommended an increasing deployment of renewables such that by 2030 half of the UK's power should be provided by renewables.
130. In its Interim Response (Oct 2018) to the Assessment the Government confirmed its ongoing commitment to promoting renewables. It recognised that, within a market-based system and with significant constraints on public expenditure, the private sector has an important role to play in the delivery of renewable energy schemes. The Government's formal response to the NIC Assessment was expected in Autumn 2019 through its publication of the UK's first comprehensive National Infrastructure Strategy. This has been delayed.

4.3.7 UK Climate Emergency (2019)

131. In May 2019 a National Climate Emergency was declared by the UK Parliament. MPs called on Government to make changes that included setting a new target of reaching net zero emissions before 2050.

4.3.8 Net Zero – The UK's contribution to stopping global warming advice report (May 2019)

132. The UK's declared National Climate Emergency was informed by the publication of this report, prepared by the Committee on Climate Change which is an independent advisor to Government on these matters. It recommended the new emissions target for the UK of net-zero greenhouse gases by 2050. The accompanying Net Zero Technical Report (May 2019)

suggested the potential for 29-96 of GW of onshore wind, 145-615 GW of solar power and 95-245 GW of offshore wind in the UK.

133. A number of findings were made in these report that are relevant to the Proposed Development:
- Scenarios for 2030 and 2050 see variable renewables providing 50-75% of overall electrical energy production.
 - Improvements in system flexibility can come from increased deployment of battery storage.
 - Significant new renewable generation capacity is needed to accommodate rapid uptake of electric vehicles and hybrid heat pumps. Over the period to 2035, up to 35 GW onshore wind, 45 GW offshore wind and 54 GW solar PV could be needed.
 - The UK's onshore wind, offshore wind and solar PV resource are likely to be more than adequate to deliver an expanded and decarbonised electricity system to 2050.

4.3.9 Climate Change Act 2008 (2050 Target Amendment) Order 2019

134. On 27 June 2019 the UK Parliament approved the net zero target in law, thereby changing the original target of 80% reduction of greenhouse gas emissions (compared to 1990 levels) in the UK by 2050 to 100%.
135. The aim is to meet the target through UK domestic effort, without relying on international carbon units (or 'credits').
136. Meeting this Net Zero Target will require major and urgent investment in new technologies and prioritisation of sustainable energy and cleaner power generation, including the use of solar.

4.3.10 Leading on Clean Growth (October 2019)

137. The Government Response, 'Leading on Clean Growth' (October 2019), reported on key achievements in the UK power sector including a record 33% of electricity generation from renewables in 2018, a rise of low carbon generation to some 52%, and 18 consecutive days of coal-free generation. It also recognises ongoing reform of the energy system to deliver greater system flexibility in order to integrate significant quantities of low carbon generation.

4.3.11 Reducing UK emissions - 2020 Progress Report to Parliament (June 2020)

138. The Committee for Climate Change published a 2020 report to Parliament, assessing progress in reducing UK emissions over the past year. The report included new advice to the UK Government on securing a green and resilient recovery following the COVID-19 pandemic, including the need to seize the opportunity to turn the crisis into a defining moment in the fight against climate change. Although a limited number of steps have been taken over the past year to support the transition to a net-zero economy and improve the UK's resilience to the impacts of climate change, the Committee identified that much remains to be done.
139. One of the Committee's recommendations to the Department for Business, Energy & Industrial Strategy is to deliver plans to decarbonise the power system to reach an emissions intensity of 50 gCO₂/kWh by 2030, with at least 40 GW of offshore wind and a role for onshore wind and large-scale solar power, with a clear timetable of regular auctions. The report states that reaching net-zero emissions will require all energy to be delivered to consumers in zero-carbon

forms (i.e. electricity, hydrogen, hot water in heat networks) and come from low carbon sources including renewables such as solar.

140. The path to achieving net-zero emissions by 2050 will necessarily entail a steeper reduction in emissions over the intervening three decades and, to reach the UK's new Net Zero target, emissions will need to fall on average by around 14 MtCO₂e every year, equivalent to 3% of emissions in 2019.

4.4 Local Climate Emergency

4.4.1 Hertsmere Climate Emergency

141. The strategy and action plan for how HBC will achieve net zero carbon emissions by 2050 was approved by Full Council on 14 October. Hertsmere is one of 205 local authorities, alongside HCC, St Albans City and District Council, Watford Borough Council and Dacorum Borough Council, who have declared a climate emergency and committed to taking urgent action to reduce their carbon emissions. Hertsmere declared a climate emergency in September 2019 and is committed to achieving carbon neutrality as soon as possible and no later than 2050. Hertsmere approved their Climate Change and Sustainability Action Plan in 2020 and issued an interim planning policy statement in October 2020 setting out how the local development plan policies should be applied until the replacement local plan is adopted.
142. The Proposed Development will generate electricity from a renewable resource and thus responds directly to the threat of climate change. The anticipated CO₂ displacement is around 25,400 tonnes per annum, which represents an emission saving equivalent of a reduction in c.8,100 cars on the road every year. It is also estimated the solar farm will increase the total amount of renewable electricity generated in Hertsmere from 5.4% to 20%, bringing Hertsmere closer to the national average of 33% electricity generated from renewable sources.

4.5 National Planning Policy

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

143. EN-1 sets out the Government's national policy for the delivery of major energy infrastructure. Whilst primarily of relevance to nationally significant infrastructure projects (NSIPs) over 50MW, it is clearly a material consideration for the Proposed Development which is just below the NSIP threshold.
144. EN-1 establishes the need for energy related development with the Government not requiring decision makers to consider need on individual applications because of this.
145. Paragraph 1.7.2 of EN-1 states that energy National Policy Statements should speed up the transition to a low carbon economy and help to realise UK climate change commitments sooner than continuation under the current planning system. It is also acknowledged that the development of new energy infrastructure, at the scale and speed required to meet the current and future need, is likely to have some negative effects on biodiversity, landscape/visual amenity and cultural heritage. However, EN-1 advises that in general it should be possible to mitigate satisfactorily the most significant potential negative effects.
146. The Government's policy on energy infrastructure development is critical to understanding the policies on need. Paragraph 2.1.1 states that there are three key goals, namely reducing carbon emissions, energy security and affordability. Producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of both large and small scale

infrastructure. Large scale infrastructure plays a "vital role" in ensuring security of supply (paragraph 2.1.2).

147. The transition to a low carbon economy is dealt with at paragraphs 2.2.5 to 2.2.11. The UK needs to wean itself off a high carbon energy mix, to reduce GHG emissions, and to improve the security, availability and affordability of energy through diversification. Under some of the "illustrative" 2050 pathways electricity generation would need to become virtually emission-free.
148. Paragraph 2.2.23 states that *"The UK must therefore reduce over time its dependence on fossil fuels, particularly unabated combustion. The Government plans to do this by improving energy efficiency and pursuing its objectives for renewables, nuclear power and carbon capture and storage"*.
149. Paragraph 3.3.10 also states that as part of the UK's need to diversify and decarbonise electricity generation, the Government is committed to dramatically increasing the amount of renewable energy capacity. Paragraph 3.3.11 goes on to state that an increase in renewable electricity is essential to enable the UK to meet its commitments under the EU Renewable Energy Directive.
150. Paragraph 3.3.12 highlights that there are several other technologies which can be used to compensate for the intermittency of renewable generation, such as electricity storage. Although Government believes these technologies will play important roles in a low carbon electricity system, the development and deployment of these technologies at the necessary scale has yet to be achieved.
151. Overall, EN-1 Section 3.4 identifies that large-scale deployment of renewables will help the UK to tackle climate change, reducing the UK's emissions of carbon dioxide by over 750 million tonnes by 2030. Paragraph 3.4.5 makes it clear that *"The need for new renewable electricity generation projects is therefore urgent"*.

4.5.2 National Planning Policy Framework (2019)

152. The National Planning Policy Framework (February 2019) (NPPF) sets out the Government's planning policies for England and how these should be applied. At its core is the need for the planning system to contribute to the achievement of sustainable development – meeting the needs of the present without compromising the ability of future generations to meet their own needs.
153. Paragraph 8 of the NPPF explains that achieving sustainable development means the planning system has three overarching and interdependent objectives:
 - ***"an economic objective*** - to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
 - ***a social objective*** - to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being ; and
 - ***an environmental objective*** - to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to

improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”

154. The environmental objective in particular is applicable to renewable energy developments.
155. Paragraph 11 of the NPPF stipulates when determining planning applications, a presumption in favour of sustainable development should be applied and specifically:
- “c) approving development proposals that accord with an up-to-date development plan without delay; or*
- d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:*
- i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or*
- ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.”*
156. Paragraph 12 underlines that the **presumption in favour of sustainable development** does not change the statutory status of the development plan as the starting point for decision making. The policies within the local development plan are considered below.
157. Section 6 of the NPPF refers to the economy and paragraph 83 in particular states that in supporting a prosperous rural economy planning decisions should **enable the development and diversification of agricultural and other land based rural business**.
158. Paragraph 98 states that planning policies and decisions should protect and **enhance public rights of way and access**, including taking opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails.
159. Paragraph 109 directs that development should only be prevented or refused on highway grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.
160. Paragraph 118 (a) states that planning policies and decisions should **“encourage multiple benefits from both urban and rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains – such as developments that would enable new habitat creation or improve public access to the countryside.”**
161. Paragraph 124 states that **good design** is a key aspect of sustainable development. Paragraph 127 advises that planning policies and decisions should ensure developments function well and add to the overall quality of the area. They should be visually attractive as a result of good layout and appropriate and effective landscaping; be sympathetic to local character and history including landscape setting; and accommodate green space and be safe and accessible with a high standard of amenity and promoting health and well-being. Design quality should be considered throughout the evolution and assessment of development proposals (paragraph 128) and applications that can demonstrate early, proactive and effective engagement with the community should be looked on more favourably than those that cannot.
162. Paragraph 133 outlines that the Government attaches great importance to **Green Belts**. The fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence.
163. Paragraph 134 sets out that **“Green Belt serves five purposes:**

- a) *to check the unrestricted sprawl of large built-up areas;*
 - b) *to prevent neighbouring towns merging into one another;*
 - c) *to assist in safeguarding the countryside from encroachment;*
 - d) *to preserve the setting and special character of historic towns; and*
 - e) *to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.”*
164. Paragraph 143 of the NPPF states “inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances”.
165. Paragraph 144 states “*When considering any planning application, local planning authorities should ensure that substantial weight is given to any harm to the Green Belt. “Very special circumstances” will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any harm resulting from the proposal, is clearly outweighed by other considerations.*”
166. Paragraph 147 states “*When located in the Green Belt, elements of many renewable energy projects will comprise inappropriate development. In such cases developers will need to demonstrate very special circumstances if projects are to proceed. **Such very special circumstances may include the wider environmental benefits associated with increased production of energy from renewable sources***”.
167. Paragraph 148 sets out that the planning system should **support the transition to a low carbon future in a changing climate and it should help minimise vulnerability and improved resilience**. It states that it should shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience, and support renewable and low carbon energy and associated infrastructure.
168. Paragraph 153 states that local planning authorities should **expect new development to take account of landform, layout, building orientation, massing and landscaping**.
169. Paragraph 154 sets out that when determining planning applications for renewable and low carbon development, local planning authorities should **not require applicants to demonstrate the overall need** for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and **approve the application if its impacts are (or can be made) acceptable**.
170. Paragraph 155 sets out that inappropriate development in areas at **risk of flooding** should be avoided by directing development away from areas at highest risk. Paragraph 163 directs that when determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere and that applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment it can be demonstrated that;
- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
 - b) the development is appropriately flood resistant and resilient;
 - c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
 - d) any residual risk can be safely managed; and
 - e) safe access and escape routes.

171. Paragraph 170 states that planning policies and decisions should contribute to and enhance the natural and local environment including by **protecting and enhancing valued landscapes**, recognising the **intrinsic character and beauty of the countryside**, by **protecting and enhancing soils**, **minimising impacts on biodiversity** and preventing new development from contributing to, being put at unacceptable risk from, or being adversely affected by, **unacceptable levels of air or noise pollution**.
172. Paragraph 171 of the NPPF goes on to describe that Plans should distinguish between the hierarchy of designated sites and allocate land with the least environmental value and footnote 53 states where significant development of **agricultural land** is demonstrated to be necessary, areas of poorer quality land should be preferred to those of higher quality.
173. Paragraph 175 sets out the principles that local planning authorities should apply with regard to **habitats and biodiversity** when determining planning applications including refusing applications where significant harm to biodiversity cannot be mitigated/compensated for; protecting SSSIs; refusing developments that result in the loss or deterioration of irreplaceable habitats unless there are wholly exceptional; and **encouraging opportunities to incorporate biodiversity improvements especially where this can secure measurable gains for biodiversity**.
174. Paragraph 177 **refers back to sustainable development in relation to appropriate assessment** and states: ‘the presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site’.
175. Paragraph 178 refers to planning decisions taking account of ground conditions and risks arising from land instability and contamination at sites. In relation to risks associated with land remediation account is to be taken of ‘potential impacts on the natural environment’ that arise from land remediation.
176. Paragraph 180 states that planning policies and decisions should also **ensure that new development is appropriate for its location** taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.
177. Paragraph 189 states that in determining applications, local planning authorities should require the applicant to **describe the significance of any heritage assets affected, including the contribution made by their setting**. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should be consulted, and the heritage assets assessed using appropriate expertise where necessary. Where a site on which a development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.
178. Paragraph 193 states that *“great weight”* should be given to the conservation of the significance of designated heritage assets and *“the more important the asset, the greater the weight should be”*. Paragraphs 194-197 set out the policy tests for different levels of harm to the significance of heritage assets of differing levels of importance.

179. The Glossary of the NPPF defines renewable and low carbon energy, including energy for heating and cooling as well as generating electricity. **Renewable energy covers those energy flows that occur naturally and repeatedly in the environment including from the sun. Low carbon technologies are those that can help reduce emissions (compared to conventional use of fossil fuels).**

4.6 Local Planning Policy

180. The solar panels, substation, battery energy storage and ancillary infrastructure is wholly located within the jurisdiction of HBC who will act as the Local Planning Authority and determining authority for the Application.
181. The Development Plan for the purposes of determining the Application therefore comprises the following documents;
- Local Plan Core Strategy Development Plan Document 2013; and
 - Site Allocation and Development Management Plan 2016.
182. The Core Strategy sets out the Council's vision and strategy for the Borough for the next 15 years. The Site Allocations and Development Management Policies Plan sets out detailed proposals and policies by which the Council sees the aims and objectives of the Core Strategy being best achieved.
183. The council is currently preparing a New Local Plan, planning for the future development in the Borough. The New Local Plan is anticipated to be adopted in late 2021.
184. The council published the Hertsmer Local Plan Issues and Options in 2017 for public consultation. The consultation period closed in November 2017. The Vision Statement within the Issues and Options document highlighted that the borough plans for greater renewable energy generation of different types, including solar development.
185. No Neighbourhood Plans have been "made" although Radlett Neighbourhood Plan 2019 2026 has undergone independent examination and will be put to referendum for adoption in May 2021. This Plan covers the town of Radlett and its hinterland approximately 400m to the north of the Site at its closest boundary. Review of the emerging Radlett Neighbourhood Plan has concluded no policies are relevant to this application.

4.6.1 Hertsmer Core Strategy 2013

186. The Council readily acknowledges the need for new development but recognises that a balanced Core Strategy must include strategic policies relating to the protection of the natural and built environment. The Core Strategy therefore sets out in its strategic aims and objectives to (*inter alia*);
- "To protect the Green Belt" Local Plan Core Strategy Objective 2
 - "To improve environmental and streetscape quality in town centres and protect and enhance the built heritage of Hertsmer" Local Plan Core Strategy Objective 6
 - "To provide a planning framework which promotes sustainable and competitive economic performance, in support of jobs growth requirements" Local Plan Core Strategy Objective 11
 - "To protect and enhance local biodiversity" - Local Plan Core Strategy Objective 13
 - "To conserve and enhance biodiversity, conservation management... should go beyond merely maintaining the existing landscape features and aim to enhance them

through restoration and creation of habitats, together with a reduction in fragmentation by linking, buffering and expanding.” - P.18, Hertfordshire Biodiversity Action Plan.

187. Policy SP1 - Creating sustainable development underlines that the Council will work with key local stakeholders to enable development in the Borough to make a sustainable contribution to delivering the Core Strategy Spatial Vision and Strategy promoting decentralised and renewable or low carbon sources without unacceptable impacts on (*inter alia*) the characteristics and features of the natural and built environment, green belt, heritage, biodiversity, flood risk or the historic environment.
188. Policy SP2 - Presumption in Favour of Sustainable Development states that when considering development proposals the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. It will always work proactively with applicants jointly, in particular through the preapplication process, to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.
189. Policy CS12 – Enhancement of the Natural Environment requires all development proposals must conserve and enhance the natural environment of the Borough, including biodiversity, habitats, protected trees, landscape character, and sites of ecological and geological value, in order to maintain and improve environmental quality, and contribute to the objectives of the adopted Greenways Strategy and the Hertsmere Green Infrastructure Plan. Proposals should provide opportunities for habitat creation and enhancement throughout the life of a development.
190. Policy CS13 - The Green Belt sets out a is a general presumption against inappropriate development within the Green Belt, as defined on the Policies Map, and such development will not be permitted unless very special circumstances exist. Development proposals, including those involving previously developed land and buildings, in the Green Belt will be assessed in relation to the NPPF.
191. Policy CS14 - Protection or enhancement of heritage assets All development proposals must conserve or enhance the historic environment of the Borough in order to maintain and where possible improve local environmental quality. Development proposals should be sensitively designed to a high quality and not cause harm to identified, protected sites, buildings or locations of heritage or archaeological value including Conservation Areas, Listed Buildings, Historic Parks and Gardens, Scheduled Ancient Monuments or their setting, and identified and as yet unidentified Archaeological Remains.
192. Policy CS15 – Promoting recreational access to open spaces and the countryside. The Council will work with its partners and relevant agencies to safeguard, enhance and facilitate access to parks, open spaces, rural visitor attractions and to the wider local countryside. Measures which secure the provision of safer and more secure car-free access including enhancements and additions to the rights of way / Greenways network as set out in the Council’s Greenways Strategy, will be actively sought where they do not present a risk to the biodiversity value and intrinsic environmental quality of the locality.
193. Policy CS16 - Environmental impact of new development states that the Council will work with key partners, including the Environment Agency and Natural England, to ensure that development proposals do not create an unacceptable level of risk to occupiers of a site, the local community and the wider environment. Proposals are required to incorporate sustainability principles, minimising their impact on the environment and ensuring prudent use of natural resources by measures including (*inter alia*) avoiding development in the floodplain

and close to river corridors unless the requirements of the sequential and exceptions tests have been met and flood prevention/mitigation measures are in place as required by the Environment Agency. Following the publication of the position statement on the Hertsmere Climate Change and Sustainability Action Plan (HCCSAP), applicants are requested to go further than creation of an ‘unacceptable level’ but to make a positive contribution towards the area, its bio-diversity alongside climate change adaptation and mitigation.

194. Policy CS22 - Securing a high quality and accessible environment in line with the Planning and Design Guide SPD the Council will require all development to be of high-quality design, which ensures the creation of attractive and usable places. Development proposals should take advantage of opportunities to improve the character and quality of an area and conserve the Borough's historic environment.

4.6.2 The Site Allocation and Development Management Plan 2016

195. The following Site Allocation and Development Management Plan policies apply to the proposal:
196. SADM10 Biodiversity and habitats expects developers to avoid significant harm to sites of importance for ecology, geology and biodiversity by relocating their proposed development. Where this cannot be achieved adequate mitigation measures can be employed, which will outweigh the harm caused or adequate compensatory measures will be provided and the benefits of the development are clearly shown to outweigh the harm to the natural environment. The acceptability of any development proposal will further be assessed with regard to the level of impact that the development proposal would have on the ecological interest of the habitat concerned and the wider ecological network. Opportunities should also be available to create, incorporate, enhance, or restore habitats or biodiversity as part of the development.
197. Policy SADM11 - Landscape Character: Development will be managed to help conserve, enhance and/or restore the character of the wider landscape across the borough. Individual proposals will be assessed for their impact on landscape features to ensure that they conserve or improve the prevailing landscape quality, character and condition, including as described in the Hertfordshire Landscape Character Assessments. The location and design of development and its landscaping will respect local features and take opportunities to enhance habitats and green infrastructure links. Landscaping schemes should use native species which are appropriate to the area.
198. Policy SADM12 - Trees, Landscaping and Development sets out that planning permission will be refused for development which would result in the loss, or likely loss, of healthy, high quality trees and/or hedgerows that make a valuable contribution to the amenity or environment of the area in which they are located. All development affecting trees, hedgerows and other plants or landscaping should be consistent with the Biodiversity, Trees and Landscape SPD and BS5837 (or any subsequent guidance). This includes the requirement for appropriate landscaping schemes and, if necessary, replacement trees.
199. Policy SADM13 – The Water Environment: The natural environment of watercourses and areas of water will be improved wherever possible through Policy SADM16. Watercourses, including culverts, land adjacent to rivers, functional floodplains and flood storage areas should be restored to their natural state.
200. Policy SADM14 Flood risk requires development to avoid the risk of flooding or be reduced by locating development within areas of lower flood risk through the application of the sequential

test and then applying an exception test in line with the NPPF; and ensuring that development proposals in flood risk areas actively manage and reduce flood risk by applying the sequential approach at site level. Where new development is proposed in a flood risk area, a site-specific Flood Risk Assessment is required.

201. Policy SADM16 Watercourses: Development on sites that contain a watercourse or are situated next to a watercourse will comply with the following principles (*inter alia*), conserving or improving the natural environment of the watercourse, maintaining a minimum 9m wide undeveloped buffer zone will be provided from the top of the bank of any watercourse and supporting opportunities for restoration and enhancement within the catchment of the watercourse.
202. Policy SADM20 Environmental pollution and development: Development should not result in any adverse impact to public health or wellbeing, or significantly add to contamination or pollution, taking into account the situation following any mitigation and remediation measures. Development on land that is known to be or suspected to be contaminated (or polluted) will only be permitted where a contaminated land assessment shows that the proposed development would not be likely to result in a threat to the health of the future users or occupiers of the site after any remediation measures are taken into account. The use of the site must be considered compatible with the level of pollution or contamination that is present or would be present after remediation measures are taken into account.
203. Policy SAD26 Development Standards in the Green Belt directs that the Council will assess all applications for development in the Green to ensure they comply with the following principles (*inter alia*); developments should take advantage of site contours and landscape features in order to minimise the visual impact; the scale, height and bulk of the development should be sympathetic to, and compatible with, its landscape setting and not be harmful to the openness of the Green Belt; developments should use materials which are in keeping with those of the locality, and, where modern materials are acceptable, they should be unobtrusive; and existing trees, hedgerows and other features of landscape and ecological interest should be retained and enhanced.
204. Policy SADM27 supports diversification and development supporting the rural economy. Proposals for the diversification of farm enterprises which involve new building and/or works, will be permitted provided the site is of a lower agricultural land grade (i.e. Grade 3b, 4, 5 or non-agricultural); and there is a reliable prospect that the land will be restored to at least its original quality. All development which is supported in principle under this policy must also satisfy the requirements of Policy SADM26.
205. Policy SADM29 Heritage Assets, including Registered Parks and Gardens explains that planning applications will be considered in accordance with the NPPF. When applications are submitted for proposals affecting any heritage asset the applicant must clearly explain what the proposal is for and provide sufficient detail to allow for an informed decision to be made. When assessing proposals, the Council will have regard to the significance of the heritage asset and the potential harm to it. The Council expects features of known or potential archaeological interest to be identified, assessed, surveyed, recorded and wherever possible retained. Developers will therefore be required to undertake an archaeological field assessment and submit a report on the findings before the Council will grant planning permission.
206. Policy SADM30 - Design Principles: Development which complies with the policies in this Plan will be permitted provided it makes a positive contribution to the built and natural environment; recognises and complements the particular local character of the area in which it is located,

and results in a high quality design. In order to achieve a high quality design, a development must respect, enhance or improve the visual amenity of the area by virtue of its scale, mass, bulk, height, urban form; and have limited impact on the amenity of occupiers of the site, its neighbours, and its surroundings in terms of outlook, privacy, light, nuisance and pollution.”

207. Policy SADM40 Highway and Access Criteria for New Development sets out that development will be permitted where (*inter alia*) it will not harm the safety of any users of the highway network, cause or add significantly to road congestion or unduly harm the flow of vehicles.
208. Policy SADM41 - Aviation Safeguarding: The Council will consult with the Elstree Aerodrome Licensee on relevant proposals for development. It will only permit development proposals which will not compromise the Aerodrome’s operational integrity and general safety and are compatible with the continued use of the site as an aerodrome.

4.7 Online Planning Practice Guidance (March 2014 as updated)

209. The key aim of the Planning Practice Guidance is to provide easily accessible and understandable guidance on the implementation of the policies within the NPPF. It contains specific guidance on planning policies for renewables energy developments and on how planning applications should be determined with regards to their impact on the natural and historic environment. Consideration of the fundamental aspects of this guidance in relation to the Application are detailed below.

4.7.1 Renewable and Low Carbon Energy

210. The guidance provides further advice on renewable and low carbon energy projects to facilitate the delivery of the low carbon future. It states that the government remains committed to increasing the amount of energy from renewable and low carbon technologies to ensure that the UK has a secure energy supply, to slow down climate change and to stimulate new jobs and businesses.
211. Paragraph 13 within the guidance specifically relates to large scale ground-mounted solar². It states that:

“The deployment of large-scale solar farms can have a negative impact on the rural environment, particularly in very undulating landscapes. However, the visual impact of a well-planned and well-screened solar farm can be properly addressed within the landscape if planned sensitively.

Particular factors a local planning authority will need to consider include:

- *encouraging the effective use of land by focussing large scale solar farms on previously developed and non-agricultural land, provided that it is not of high environmental value;*
- *where a proposal involves greenfield land, whether*
 - i. the proposed use of any agricultural land has been shown to be necessary and poorer quality land has been used in preference to higher quality land; and*
 - ii. the proposal allows for continued agricultural use where applicable and/or encourages biodiversity improvements around arrays;*

² Paragraph: 013 Reference ID: 5-013-20150327, published 27 March 2015

- *that solar farms are normally temporary structures and planning conditions can be used to ensure that the installations are removed when no longer in use and the land is restored to its previous use;*
- *the proposal's visual impact, the effect on landscape of glint and glare and on neighbouring uses and aircraft safety;*
- *the extent to which there may be additional impacts if solar arrays follow the daily movement of the sun;*
- *the need for, and impact of, security measures such as lights and fencing;*
- *great care should be taken to ensure heritage assets are conserved in a manner appropriate to their significance, including the impact of proposals on views important to their setting. As the significance of a heritage asset derives not only from its physical presence, but also from its setting, careful consideration should be given to the impact of large-scale solar farms on such assets. Depending on their scale, design and prominence, a large-scale solar farm within the setting of a heritage asset may cause substantial harm to the significance of the asset;*
- *the potential to mitigate landscape and visual impacts through, for example, screening with native hedges; and*
- *the energy generating potential, which can vary for a number of reasons including, latitude and aspect.*

The approach to assessing cumulative landscape and visual impact of large-scale solar farms is likely to be the same as assessing the impact of wind turbines. However, in the case of ground-mounted solar panels it should be noted that with effective screening and appropriate land topography the area of a zone of visual influence could be zero.”

4.7.2 Climate Change

212. Addressing climate change is stated as being one of the core land use planning principles which the NPPF expects to underpin decision-taking on planning applications. The guidance seeks to ensure that the planning system helps to implement the objectives of the Climate Change Act 2008 by radically reducing greenhouse gas emissions and adapting to the forecast impacts of climate change. The guidance makes it clear that Councils need to take account of global climate change including, for example, providing opportunities for renewable and low carbon energy technologies.

4.7.3 Natural Environment

213. The guidance was updated in July 2019 to address how planning can take account of the quality of agricultural land and that an agricultural land classification assessing the quality of farmland can enable informed choices to be made about its future use within the planning system. Planning decisions should take account of the economic and other benefits of the best and most versatile agricultural land. There are five grades of agricultural land, with Grade 3 subdivided in 3a and 3b. The best and most versatile land is defined as Grades 1, 2 and 3a.

4.7.4 Green Belt

214. Guidance was published in July 2019 to address the of Green Belt in the planning system and in particular what factors can be taken into account when considering the potential impact of development on the openness of the Green Belt. It states that:
215. *“Assessing the impact of a proposal on the openness of the Green Belt, where it is relevant to do so, requires a judgment based on the circumstances of the case. By way of example, the courts have identified a number of matters which may need to be taken into account in making this assessment. These include, but are not limited to:*
- *openness is capable of having both spatial and visual aspects – in other words, the visual impact of the proposal may be relevant, as could its volume;*
 - *the duration of the development, and its remediability – taking into account any provisions to return land to its original state or to an equivalent (or improved) state of openness; and*
 - *the degree of activity likely to be generated, such as traffic generation.”*

4.8 Supplementary Guidance Documents

4.8.1 Biodiversity and Trees Supplementary Planning Document (SPD) (2010)

216. This document, adopted as a SPD by HBC in 2010, provides overarching guidance in relation to biodiversity and trees within the Borough. Parts C and D specifically relate to trees and protected trees, woodlands and hedgerows respectively and set out practical guidance in relation to the considering these features in the planning and design process.

4.8.2 Hertsmere Climate Change and Sustainability Interim Planning Policy Position Statement

217. Hertsmere Climate Change and Sustainability Action Plan (October 2020): HBC declared a Climate Emergency in September 2019. In light of the urgency regarding the climate agenda, a Position Statement has been produced to provide clarifications on existing sustainability and climate change policies until the new Local Plan (2018-36) and any supplementary documentation is fully adopted. **Given the urgent need to ensure the introduction of measures to meet both government and local Climate Change commitments, the Council considers it both prudent and necessary to publish a position statement which clarifies how Hertsmere as the Local Planning Authority (LPA) will interpret its existing development plan policies in the context of updated material considerations and circumstances until the new Local Plan is published and subsequently adopted.**
218. The position statement sets out the requirements which HBC as the LPA will seek on relevant applications for planning permission in order to deliver on the requirements set out in the adopted Core Strategy (2013) and the Site Allocations and Development Management Policies (SADMP) (2016), the National Planning Policy Framework (NPPF) (2019), Climate Change and Sustainability Strategy (Hertsmere Borough Council) and the Government's recent commitments and emerging priorities on climate change.
219. **The position statement is a material planning consideration to be taken into account when determining planning applications (and appeals) until the new Local Plan is**

published and as concluded in the statement itself, it should be given significant weight in reaching planning decisions.

4.8.3 Other Guidance

220. In addition to the policy and supplementary guidance documents identified above, there are a number of other local guidance documents relevant to this LVIA, which are as follows:

- GreenArc Strategic Green Infrastructure Plan (with Hertfordshire) (2011): This document provides overarching guidance for Green Infrastructure (GI) in Hertfordshire, mapping existing GI and identifying several key strategic GI interventions across the county. In relation to the Site and study area the document identifies the Site within the 'woodland arc' GI project area, which covers a large tract of land from Bushey in the southwest to Hoddesdon in the northeast where "Recognition of the value of woodlands as a multi-functional & strategic GI asset, & to deliver aims & aspirations of related partners" is sought including the linking of woodland and increasing the diversity of woodland habitats;
- The document also identifies the aspiration to reconnect into wider GI networks within the study area by means of "Reconnection of Rights of Way that have been severed by major barriers to the movement of people & wildlife (e.g. by rivers, canals & dual carriageways)", particularly those that connect into the All London Green Grid;
- Hertsmere Borough Green Infrastructure Plan (2011): This document supports the GreenArc Plan and provides further detail at a local borough level. In relation to the Site and study area, the document identifies opportunities for 'wetland habitat zones' along Hilfield Brooks and Aldenham Brook, 'small scale conservation zones' between Letchmore Heath and Elstree Aerodrome and the opportunity to create green links to Hilfield Reservoir linking to the wider London Loop and London greenspace network;
- Hertfordshire Landscape Character Assessment: Hertsmere (2000): This document provides the main character analysis for the Borough and is used as the basis of assessment of landscape character for the LVIA.

5 Environmental Statement Assessment Methodology

5.1 Introduction

221. This Chapter sets out the methodology which has been followed in undertaking the EIA for the technical topic chapter within this ES. It describes the process of identifying and assessing the likely significant environmental effects of the Proposed Development.

5.2 EIA Requirements

222. The ES must contain the information specified in Regulation 18(3) and must meet the requirements of Regulation 18(4) of the EIA Regulations 2017. It must also include any additional information specified in Schedule 4 of the EIA Regulations 2017 which is relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.
223. Regulation 18(3) and 18(4) states:
- (3) An environmental statement is a statement which includes at least –
 - a) A description of the development comprising information on the site, design, size and other relevant features of the development;
 - b) A description of the likely significant effects of the development on the environment;
 - c) A description of any features of the development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
 - d) A description of the reasonable alternatives studies by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chose, taking into account the effects of the development on the environment;
 - e) A non-technical summary of the information referred to in sub-paragraphs (a) to (d); and
 - f) Any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.
 - (4) An Environmental Statement must:
 - a) Where a scoping opinion or direction has been issued in accordance with Regulation 15 and 16, be based on the most recent scoping opinion or direction issued (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion or direction);
 - b) Include the information reasonably required for reaching a reasoned conclusion on the significant effects of the development on the environment, taking into account current knowledge and methods of assessment; and
 - c) Be prepared, taking into account the results of any relevant UK environmental assessment, which are reasonably available to the person preparing the environmental statement, with a view to avoiding duplication of assessment.

224. Schedule 4 of the EIA Regulations 2017 set out the information which is to be included in the ES. Table 5 identifies where the information defined by Schedule 4 can be found within this ES.

EIA Regulations 2017 Required Information	Location within ES
1. A description of the development, including in particular: (a) a description of the location of the development; (b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases; (c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases).	Chapters 2 and 3
2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	Chapter 3
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	The Baseline Conditions sections of Chapter 6
4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	The Parameters Used for Assessment section and the Assessment of Likely Effects section of Chapter 6
5. A description of the likely significant effects of the development on the environment resulting from, inter alia: (a) the construction and existence of the development, including, where relevant, demolition works;	The Assessment of Likely Effects section and the Cumulative Assessment

EIA Regulations 2017 Required Information	Location within ES
(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; (g) the technologies and the substances used. The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC and Directive 2009/147/EC	sections of Chapter 6.
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	The Assessment Methodology section and the Assumptions and Limitations section of Chapter 6.
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases	The Further Mitigation and Enhancement section and Residual Effects and Monitoring section of Chapter 6.
8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and	There are no risks of major accidents and/or disasters relevant to the

EIA Regulations 2017 Required Information	Location within ES
obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	Proposed Development
9. A non-technical summary of the information provided under paragraphs 1 to 8.	Document Ref: R006
10. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.	At the end of Chapter 6

Table 5: EIA Requirements

225. In order to ensure the completeness and quality of the ES, Regulation 5 (a) and (b) require that:
- The developer must ensure that the ES is prepared by competent experts and;
 - The ES must be accompanied by a statement from the developer outlining the expertise or qualifications of such experts.
226. The relevant expertise of the EIA Team is set out in Appendix 2 of the ES Technical Appendices (Document Ref: R008).
227. Accordingly, in summary, this ES comprises the following information:
- A description of the development comprising information about the site including the nature, size and scale of the development;
 - The data necessary to identify and assess the main effects which the development is likely to have on the environment;
 - A description of the likely significant effects of the development covering direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects, explained by reference to the development's possible effects on aviation safety.
 - Where significant adverse effects are identified with respect to any of the foregoing, mitigation measures will be proposed in order to avoid, reduce or remedy those effects; and
 - A summary in non-technical language of the information specified above (Document Ref: R006).

5.3 Consultation and Engagement

228. Chapter 6 which addresses the Aviation Safety topic, summarises the consultation undertaken with the relevant technical stakeholders to inform the different stages of the EIA process.

229. Further detail regarding consultation and engagement, and the comments received throughout the consultation process is provided within the Statement of Community Involvement (Document Ref: R014).

5.4 Scope of Assessment

230. Scoping involves focusing the content of the EIA on those issues likely to result in a significant effect to the environment. It is an important tool for identifying the likely significant environmental effects of a development proposal through its design, construction, operation and decommissioning phases and ensures that appropriate mitigation options are considered, where necessary
231. An EIA Screening Request in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) for a proposed solar farm and battery storage facility on the Site was submitted by the Applicant to HBC on 4 August 2020 (ref. 2017-R001). This provided details of the baseline condition, the proposed approach to the assessment and the likely potential effects arising from the Proposed Development.
232. A response was received on 10 September 2020 (20/1183/EI1) from HBC confirming an Environmental Statement would be required under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.
233. HBC confirmed in their Screening Opinion, that the only topic that would be required to be addressed within the Environmental Statement was Aviation Safety impacts relating to the safe operation of Elstree Aerodrome.

5.5 Environmental Baseline and Assessment Parameters

234. In undertaking an EIA for any project, it is important to identify the environmental baseline for the potential receptors which may be affected. This involves forming an understanding of the environmental receptors (e.g. their sensitivity) in an area and the developments that are already affecting those receptors at the time of the assessment. This allows any future baseline conditions to be determined and the effects of the Proposed Development to be compared and / or combined with the baseline in order to ensure an informed assessment is made of the potential effects of a project as well as to allow the identification of the most appropriate mitigation which could be employed to minimise any identified likely significant adverse effects, or enhancement of any beneficial effects.
235. To establish the baseline, a study area that is appropriate for each assessment topic is identified which takes into consideration the surrounding context and the scale and range of likely significant effects (the study area for noise, for example, would cover a smaller area than that used to assess landscape and visual effects which would be experienced over a wider area, or conversely, the study areas may be the same for certain assessment topics). Confirmation of the study area for the assessment topic is set out in the topic chapter.
236. A range of environmental data is then gathered from a combination of sources in respect of each study area. This will include:
- documentary information on the site and its surroundings within each relevant study area;
 - field survey information, including: Phase 1 ecological surveys; landscape character assessments; background noise surveys; identifying the location of sensitive receptors; and

- obtaining and reviewing data held by both statutory and non-statutory consultees, as well as through consultation with relevant consultees.
237. If planning permission is granted it is anticipated that construction of the Proposed Development would commence in 2021. The assessment therefore uses a '2021 baseline' to provide a future environmental baseline against which the direct, indirect and cumulative effects can be assessed.

5.6 EIA Assessment Methodology

238. The content of the ES is based on the following:
- Review of the baseline situation through existing information, including data, reports, site surveys and desktop studies;
 - Consideration of the National Planning Policy Framework (NPPF) and accompanying Planning Practice Guidance, and the relevant statutory Development Plan and any emerging replacement plans.
 - Consideration of potential sensitive receptors;
 - Indication of likely significant environmental effects and an evaluation of their duration and magnitude;
 - Expert opinion;
 - Modelling;
 - Use of relevant technical and good practice guidance; and
 - Specific consultations with appropriate bodies.

5.7 Determining Significance

239. Significance criteria have been used to help understand, evaluate and quantify the likely significant environmental effects. In broad terms, environmental effects are described as:
- Adverse – detrimental or negative effects to an environmental resource or receptor;
 - Beneficial – advantageous or positive effects to an environmental resource or receptor; or
 - Negligible – a neutral effect to an environmental resource or receptor.
240. The significance of an effect is typically the product of two factors, the value or sensitivity of the environmental resource affected and the magnitude of the impact, while consideration may also need to be given to the likelihood of an effect occurring. A significant effect may arise as a result of a slight impact on a resource of national value or a severe impact on a resource of local value.
241. The following questions are relevant in evaluating the significance of likely environmental effects:
- Which risk groups are affected and in what way?
 - Is the effect reversible or irreversible?
 - Does the effect occur over the short, medium or long term?
 - Is the effect permanent or temporary?
 - Does the effect increase or decrease with time?

- Is the effect of local, regional, national or international importance?
- Is it a beneficial, neutral or adverse effect?
- Are health standards or environmental objectives threatened?
- Are mitigating measures available and is it reasonable to require these?

242. Specific significance criteria have been prepared as appropriate for each specialist topic, based on the above and the generic criteria set out in Table 6 below.

	Significance Level	Criteria
Significant	Substantial	These effects are assigned this level of significance as they represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites and features of national or regional importance. A change at a district scale site or feature may also enter this category.
	Major	These effects are likely to be important considerations at a local or district scale and may become key factors in the decision-making process
	Moderate	These effects, while important at a local scale, are not likely to be key decision-making issues.
Not Significant	Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
	Negligible	Either no effect or an effect which is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. Such effects should not be considered by the decision-maker.

Table 6: Significance Criteria

243. Effects that are described as ‘substantial’, ‘major’ or ‘moderate’ are determined to be significant; and effects that are described as ‘minor’ or ‘negligible’ are determined to be not significant in the context of the EIA Regulations 2017.
244. In order to provide a consistent approach and enable the comparison of effects upon different environmental components, the assessments generally use the structure and terminology as set out in Table 6. However, it is noted that for some environmental topics, significance criteria may need to differ depending on the topic assessment and conditions encountered at the Site. The Aviation Safety chapter clearly identifies and explains the specific criteria used.

5.8 Assumptions and Limitations

245. The prediction of future effects inevitably involves a degree of uncertainty. This ES identifies any difficulties that have been encountered in undertaking the assessment to date.
246. Where necessary, the topic specific assessment chapter describe the principal factors giving rise to uncertainty in the prediction of environmental effects and the degree of that uncertainty.
247. Confidence in predictions is engendered by employing accepted assessment methodologies. Uncertainty inherent within the prediction is described within the limitations section of Chapters 6 as required.
248. Uncertainty also applies to the success or otherwise of measures to mitigate adverse environmental effects. Where the success of a mitigation measure is uncertain, the extent of the uncertainty is identified.

5.9 Mitigation, Monitoring and Enhancement

249. Consideration has been given to the potential mitigation measures which could be used to ensure that likely adverse significant environmental effects of the Proposed Development are reduced.
250. In the hierarchy of mitigation, likely significant adverse effects should, in the first instance, be avoided altogether; where this is not possible such effects should then be reduced and, finally, offset.
251. Significant adverse effects are best avoided by incorporating appropriate measures into the design process. As such, the iterative nature of the EIA process has assisted in informing the development of the final design of the Proposed Development.
252. Two broad types of potential mitigation measures are being applied in the EIA and are reported in this ES, namely:
- embedded mitigation - those designed to be an inherent part of the scheme for which planning permission is sought (e.g. limiting the height of the solar PV panels). Embedded mitigation evolves through the iterative design process and early consideration of the likely significant effects; and
 - further mitigation - those which require further activity to be achieved, are identified through carrying out assessments and do not form part of the scheme design in their own right.
253. Opportunities to provide environmental enhancements, or to maximise beneficial effects, will be sought where possible.
254. The Proposed Development has been developed in such a way that the reduction and, wherever possible, elimination of significant adverse environmental effects is integral to the overall design approach.

5.10 Cumulative Effects

255. Cumulative impacts are those effects of development that may interact in an additive or subtractive manner with the impacts of other development that are not currently in existence but may be by the time the Proposed Development is implemented.
256. A review has been undertaken of the HBC's planning portal to identify any potential cumulative development sites within 5km of the Site and, in consultation with the Planning Department, no planning applications or any other consented developments that would warrant a cumulative impact assessment have been identified.

5.11 In-Combination Effects

257. Effects to the environment can result from incremental changes caused by interactions between effects resulting from an individual development. These effects are also reviewed in the technical topic chapter of this ES.

5.12 Residual Effects and Monitoring

258. At the end of the technical topic chapter the residual likely significant effects arising from the Proposed Development are described. These are defined as effects which cannot be reduced to a 'not significant' level through the application of both embedded and/or further mitigation and therefore remain in place after mitigation has been incorporated

5.13 Structure of Technical Topic Chapter

259. Throughout the EIA process, the likely significant environmental effects of the development will be assessed. Within Chapter 6 the information which will inform the EIA process has been broadly set out as follows:

- Introduction;
- Legislation, Policy, Guidance and Standards;
- Consultation;
- Parameters Used for Assessment;
- Assessment Methodology and Significance Criteria;
- Assumptions and Limitations;
- Cumulative Assessment;
- Further Mitigation and Enhancement;
- Residual Effects and Monitoring; and
- Summary and Conclusion.

6 Aviation Risk

6.1 Introduction

260. Pager Power was commissioned in September 2020 to carry out a Glint and Glare Assessment of the proposed solar farm and battery storage ('the Proposed Development') at the Land North East and West of Elstree Aerodrome, Hertfordshire on behalf of Elstree Green Limited.
261. This Chapter describes the baseline conditions, glint and glare guidelines, methodology, and the potential glint and glare effects from the Solar Park within the Proposed Development with regard to and potential risk on Aviation Safety to the operations of Elstree Aerodrome.

6.2 Legislation, Policy, Guidance and Standards

6.2.1 National policy and Guidance

262. This section presents details regarding the relevant guidance and studies with respect to the considerations and effects of solar reflections from solar panels, known as 'Glint and Glare'.
263. The National Planning Policy Framework under the planning practice guidance for Renewable and Low Carbon Energy (specifically regarding the consideration of solar farms, paragraph 013) states:

The deployment of large-scale solar farms can have a negative impact on the rural environment, particularly in undulating landscapes. However, the visual impact of a well-planned and well-screened solar farm can be properly addressed within the landscape if planned sensitively.

Particular factors a local planning authority will need to consider include:

...

- *the proposal's visual impact, the effect on landscape of glint and glare (see guidance on landscape assessment) and on neighbouring uses and aircraft safety;*
- *the extent to which there may be additional impacts if solar arrays follow the daily movement of the sun;*

...

The approach to assessing cumulative landscape and visual impact of large scale solar farms is likely to be the same as assessing the impact of wind turbines. However, in the case of ground-mounted solar panels it should be noted that with effective screening and appropriate land topography the area of a zone of visual influence could be zero (our emphasis).'

6.2.2 Technical Approach

264. The approach is set out in the ES Technical Appendices (Document Ref: R008) which is to undertake geometric reflection calculations and, where a solar reflection is predicted, consider the visibility between the receptor and the reflecting solar panels. The scenario in which a solar reflection can occur for all receptors is then identified and discussed, and a comparison is made against the available solar panel reflection studies to determine the overall effect. This approach is aligned with the limited formal guidance on the topic and with industry best practice.

6.2.3 Aviation Guidance

265. Guidelines exist in the UK (produced by the Civil Aviation Authority – CAA) and in the USA (produced by the Federal Aviation Administration – FAA) with respect to solar developments and aviation activity, however a specific methodology for aviation assessments in the UK, especially regarding UK civil aerodromes, has not been produced to date. Therefore, Pager Power has reviewed existing guidelines and the available studies (ES Technical Appendices (Document Ref: R008) in the process of defining its own glint and glare assessment guidance (see ES Technical Appendices (Document Ref: R008). Pager Power guidance document defines the process for determining the impact upon aviation activity. Pager Power's approach is to undertake geometric reflection calculations and, where a solar reflection is predicted, undertake solar intensity calculations in line with the Sandia National Laboratories' FAA methodology. The scenario in which a solar reflection can occur is identified and discussed, and a comparison is made against the available solar panel reflection studies to determine the overall impact.

6.2.4 Local Policy and Guidance

266. Planning Policy SADM41 in Hertsmere Borough Council's Site Allocation and Development Management Plan 2016 concerns Aviation Safeguarding. The policy states that the Council will consult with the Elstree Airport Licensee on relevant proposals for development. It will only permit development proposals which will not compromise the Aerodrome's operational integrity and general safety and are compatible with the continued use of the site as an aerodrome. There is no local policy and guidance for glint and glare assessments.

6.3 Consultation

267. Consultation was carried out with the Elstree Airport Aerodrome manager in November 2020 and the findings of the initial glint and glare modelling were shared and discussed. Elstree Aerodrome is an operational general aviation aerodrome that operates on a 'visual approach' basis only. Subject to the proposed mitigation strategy and the very limited period when the potential for yellow glare occurring the Aerodrome did not consider, subject to review of the final assessment, any potential operational constraints on the operation of the aerodrome.
268. The aim of the consultation was to understand the aerodrome position towards the proposed development and implement adequate mitigation strategies to reduce its impact. The aerodrome's feedback was incorporated within the overall assessment process.

6.4 Parameters Used for Assessment

269. Full parameters can be found in the Glint and Glare assessment submitted in the ES Technical Appendices (Document Ref: R008). These included the specific panel configuration and the Sun path throughout the year.

6.5 Assessment Methodology and Significance Criteria

6.5.1 Methodology Overview

270. The glint and glare assessment methodology has been derived from the information obtained through consultation with stakeholders and by reviewing the available guidance and studies. Information regarding the methodology is set out on the ES Technical Appendices (Document Ref: R008).

6.5.1.1 Pager Power's Methodology:

- Identify receptors in the area surrounding the Proposed Solar Development (further details for identification of aviation receptors are presented below).
 - Consider direct solar reflections from the Proposed Solar Development towards the identified receptors by undertaking geometric calculations.
 - Consider the visibility of the panels from the receptor's location. If the panels are not visible from the receptor then no reflection can occur.
 - Based on the results of the geometric calculations, determine whether a reflection can occur, and if so, at what time it will occur.
 - Consider both the solar reflection from the Proposed Solar Development and the location of the direct sunlight with respect to the receptor's position.
 - Consider the solar reflection with respect to the published studies and guidance.
 - Determine whether a significant detrimental effect is expected in line with the process presented within the 'Quantifying and Assessing effects section'.
271. Within the Pager Power model, the Proposed Solar Development area is defined, as well as the relevant receptor locations. The result is a chart that states whether a reflection can occur, the duration and the panels that can produce the solar reflection towards the receptor.

6.5.1.2 Sandia National Laboratories' Methodology:

272. Sandia National Laboratories developed the Solar Glare Hazard Analysis Tool (SGHAT) which is no longer available. Whilst strictly applicable in the USA and to solar Photovoltaic developments only, the methodology and associated guidance is widely used by UK aviation stakeholders. The SGHAT model was used for the glint end glare assessment (ES Technical Appendices (Document Ref: R008).

6.5.1.3 Approach Paths

273. The magnitude of effect upon the panes approaching the runway³ (also referred as Approach Paths) receptors is dependent on the following main factors:
- Whether a reflection is predicted in practice and the reflective area is visible.
 - The intensity of the reflected light and weather it has potential for afterimage.
 - The location of the reflecting panels relative to key locations of the aerodrome (a reflection generated near sensitive areas such as the runway threshold is expected to have a higher impact upon the pilots landing).

³ Only planes approaching are considered for the assessment. It is expected that for planes departing pilots will be looking upwards and will either not focus on objects on the ground or not be significantly affected by reflection generated at ground level.

274. The receptor sensitivity in the case of a pilot approaching the runway can vary between “Medium” to “High”. Cases where operations were significantly affected beyond baseline conditions, a significant effect would occur. A ‘Moderate’ or higher magnitude of effect to pilots approaching the runway would be considered significant. This is where a technical or operational effect would materially affect safety. Overall, the level of effect which would be considered ‘significant’ with respect to EIA if the resultant significance of effect was ‘Moderate Adverse’ or higher. The Approach path receptors considered for the assessment are shown in the ES Technical Appendices (Document Ref: R008).
275. For mitigation, as a general guidance is:
- A Major Adverse effect would result in mitigation which is a requirement for Approach Paths.
 - A Minor Adverse effect does not require mitigation unless specifically requested by the Aerodrome Management.
 - A Moderate Adverse effect may result in mitigation either as a requirement or a recommendation dependent on factors such as time and duration of effects, location compared to key locations of the aerodrome, distance from the reflective surface and level of visibility of the reflective surface.

6.5.2 Quantifying and Assessing Effects

276. Each effect is assessed based on its magnitude and the sensitivity of the affected receptor. The classifications of effect magnitude are presented in Table 7 below.

Magnitude of Effect	Criteria for assessing effect
High	Total loss or substantial alteration to key features of the baseline conditions such that receptor attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key features of the baseline conditions such that receptor attributes will be materially changed.
Low	A minor shift away from baseline conditions. Change arising from the alteration will be discernible but not material. The underlying attributes of the baseline condition will be largely unchanged.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a ‘no change’ situation.

Table 7: Defining Magnitude of Effect

277. The definitions are based on best practice and project experience.

6.5.3 Sensitivity of Receptor

278. The classifications of receptor sensitivity are presented in Table 8 below.

Sensitivity	Examples of receptor
High	The receptor has little ability to absorb change without fundamentally altering its present character or is of international or national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character or is of high importance.
Low	The receptor is tolerant of change without detriment to its character or is of low or local importance.

Table 8: Defining Sensitivity of Receptor

279. The definitions are based on best practice and project experience.

6.5.4 Significance of Effect

280. The significance of an environmental effect is determined by the interaction of magnitude and sensitivity. The Effect Significance Matrix is set out in Table 9 below.

Magnitude	Sensitivity		
	High	Medium	Low
High	Major Adverse	Major Adverse	Moderate Adverse
Moderate	Major Adverse	Moderate Adverse	Moderate Adverse
Low	Minor Adverse	Minor Adverse	Minor Adverse
Negligible	Negligible	Negligible	Negligible

Table 9: Matrix for Assessing Significance of Effect

6.5.5 Duration of effects

281. The classifications of duration of effects are presented in Table 10 below.

Duration of Effect	Criteria for assessing effect
Permanent	Effects are possible for the entire lifetime of the Proposed Development.
Long Term	Effects are possible for the majority of the lifetime of the Proposed Development.
Medium Term	Effects are possible for half of the lifetime of the Proposed Development.
Short Term	Effects are possible for only at a short initial period of the lifetime of the Proposed Development.

Table 10: Defining Magnitude of Effect

6.5.6 Extent of effects

282. The classifications of the extent of effects are presented in Table 11 below.

Extent of Effect	Criteria for assessing effect
Wide	Effects are experienced beyond 10km from the Proposed Development.
Intermediate	Effects are experienced between 1 to 10km from the Proposed Development.
Localised	Effects are experienced within 1km from the Proposed Development.
Limited	Effects are experienced in the immediate vicinity of the Proposed Development.

Table 11: Defining Extent of Effect

6.6 Assumptions and Limitations

6.6.1 Assessment

283. The assessment is limited to desk-based modelling. Whilst line of sight to the development from receptors has been considered, also available street view imagery and satellite mapping has been used. Furthermore, for the line of sight between the ATC Tower and the one part of the proposed development, a site survey was carried out. Images from the site towards the ATC Tower and from the ATC Tower towards the site have been provided.
284. A finite number of points within the Proposed Solar Development are chosen to build a comprehensive understanding of the entire Proposed Solar Park. This determines whether a reflection could ever occur at a chosen receptor.
285. Coordinates of the Proposed Solar Development and that of the identified receptors are based on the available imagery and sight drawings.
286. The calculations do not incorporate all of the possible panel locations within the Proposed Solar Development outline however the number of modelled points is expected to provide accurate results.
287. The altitude at each reference point is based on OSGB36 terrain data. An additional figure is then added to represent the solar panel height above ground level. The same process has been undertaken for receptor locations.
288. A single reflector height within the geometric calculations has been chosen for each reflector where the reflector is flat. This process will suitably determine whether a reflection can be experienced at a location and the general time of year and duration of this reflection. Increased accuracy could be achieved by increasing the number of heights assessed however this would only marginally change the results.
289. Only a reflection from the face of the panel has been considered. The frame or the reverse of the solar panel has not been considered.
290. The model assumes that a receptor can view the face of the solar panel whilst this may not be the case. Therefore, any predicted reflection from the face of a solar panel that is not visible to a receptor will not occur.
291. Whilst line of sight to the Proposed Solar Development from receptors has been considered, any screening in the form of trees, buildings etc. may obstruct the Sun from view of the solar panels and of the receptor is considered outside of the modelling.

6.6.2 Pager Power's Model

292. It is assumed that the panel elevation angle provided by the developer represents the elevation angle for all of the panels within the solar development unless otherwise stated.
293. It is assumed that the panel azimuth angle provided by the developer represents the azimuth angle for all of the panels within the solar development unless otherwise stated.
294. The model assumes that a receptor can view the face of every panel within the proposed development area whilst in reality this, in the majority of cases, will not occur. Therefore, any predicted reflection from the face of a solar panel that is not visible to a receptor will not occur.
295. A finite number of points within the proposed development are chosen based on an assessment resolution so we can build a comprehensive understanding of the entire development. This will determine whether a reflection could ever occur at a chosen receptor. The calculations do not incorporate all of the possible panel locations within the development outline.
296. A single reflection point on the panel has been chosen for the geometric calculations. This will suitably determine whether a reflection can be experienced at a location and the general time of year and duration of this reflection. Increased accuracy could be achieved by increasing the number of heights assessed however this would only marginally change the results and is not considered significant.
297. Whilst line of sight to the development from receptors has been considered, only available street view imagery and satellite mapping has been used. In some cases this imagery may not be up to date and may not give the full perspective of the installation from the location of the assessed receptor.
298. Any screening in the form of trees, buildings etc. that may obstruct the Sun from view of the solar panels is not considered unless stated.

6.6.3 Sandia National Laboratories' (SGHAT) Model

299. The following text is taken from the Solar Glare Hazard Analysis Tool (SGHAT) Technical Reference Manual [2] which was previously freely available. The following is presented for reference.
- The software currently only applies to flat reflective surfaces. For curved surfaces (e.g., focused mirrors such as parabolic troughs or dishes used in concentrating solar power systems), methods and models derived by Ho et al. (2011) can be used and are currently being evaluated for implementation into future versions SGHAT.
 - When enabled, PV array single- or dual-axis tracking does not account for backtracking or the effects of panel shading and blocking.
 - SGHAT does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
 - SGHAT assumes that the PV array is aligned with a plane defined by the total heights of the coordinates outlined in the Google map. For more accuracy, the user should

perform runs using minimum and maximum values for the vertex heights to bound the height of the plane containing the solar array. Doing so will expand the range of observed solar glare when compared to results using a single height value.

- SGHAT does not consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
- The variable direct normal irradiance (DNI) feature (if selected) scales the user prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
- The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.

6.7 Baseline Conditions and Receptors

300. The assessed 1km area from the Proposed Solar Park is a mix between residential (further from Proposed Solar Development) and rural (closer to Proposed Solar Development). The following have been identified:
- Residential dwellings.
 - Major roads with potentially significant amount of traffic, such as:
 - The M1.
 - The A41.
 - The Hilfield Lane.
 - Aldenham Road
 - Butterfly Road.
 - The A5183.
 - Elstree Aredrome, which has one runway (orientation 08/26) and one ATC Tower.
 - Midland Railway train line – 660m to the east of the site
301. All identified receptors considered for the assessment are shown in ES Technical Appendices (Document Ref: R008).
302. There are currently two significant reflective surfaces (water surface) located south of the Proposed Solar Development). One of them is significantly close to the threshold 08. The main source of irradiance being that of the Sun, which is deemed to be a more significant source of irradiance than solar reflections.
303. The Aerodrome operations manager outlined during consultation that aviation receptors are already made aware of safety and operational protocols when flying when the Sun is out on a clear day. Pilots approaching Elstree airport are expected to experience reflection at different times during the day.

6.8 Assessment of Likely Effects

6.8.1 Effect during construction (short term)

304. Length and intensity of solar reflections are expected to be less significant during construction phase compared to the operational phase once the Proposed Solar Development is completed. However, issues related to glint and glare can still generate during the construction of the Proposed Solar Development. Aviation receptors (“High” sensitivity): the layout and panels characteristics have been optimised to reduce the effect significance to acceptable levels.
- ATC Tower: “negligible” magnitude impact (no impact) is expected upon personnel operating in the ATC Tower. Therefore, the overall effect significance for the ATC Tower at Elstree Aerodrome is categorised as “**Negligible Adverse**”, for which mitigation is not required (ES Technical Appendices (Document Ref: R008).
 - Approach Paths: “low” magnitude impact is expected upon pilots approaching Elstree Aerodrome. Therefore, the overall effect significance for pilots approaching Elstree Aerodrome is categorised as “**Minor Adverse**” for which mitigation is not required (ES Technical Appendices (Document Ref: R008).

6.8.2 Effect During Operation (long term)

305. No mitigation is necessary for the aviation receptors which are expected to experience “**Negligible Adverse**” impact.
306. Effects upon the identified receptors are discussed in ES Technical Appendices (Document Ref: R008).

6.9 Cumulative Assessment

307. No other solar developments operational or subject to current planning application within the assessed 1km area. There would not appear to be any other consented developments that would appear to warrant a cumulative impact assessment at this time.
308. However large water surfaces are located south of Elstree Aerodrome which can generate glare. However, they can only be visible by pilots approaching runway 08. Discussion with the airport manager has highlighted that no reflection is generated by these water surfaces that affects aerodrome operations.

6.10 Further Mitigation and Enhancement

309. Aviation receptors:
- ATC Tower: “negligible” magnitude impact (no impact) is expected upon personnel operating in the ATC Tower. Therefore, the overall effect significance for the ATC Tower at Elstree Aerodrome is categorised as “Negligible Adverse”, for which mitigation is not required (see section 8.1 of Document Ref: R007).
 - Approach Paths: “low” magnitude impact is expected upon pilots approaching Elstree Aerodrome. Therefore, the overall effect significance for pilots approaching Elstree Aerodrome is categorised as “Negligible Adverse” for which mitigation is not required (see section 8.2 and 8.3 of Document Ref: R007).

- Any moderate effect experienced by pilots approaching the runways or personnel in the ATC Tower should be considered and mitigation should be implemented. The consultation with the aerodrome manager highlighted that the location of the direct sunlight with respect to the aircraft's position on approach to the runway is possible throughout the year but standard operating procedure in such occurrence for an aerodrome that operates on a visual approach basis is for the pilot to abort the landing, circle round and then re-approach when conditions are more favourable. The aerodrome manager would anticipate a pilot would be trained to take the same course of action in the event of any occurrence of yellow glare or residual image.

6.11 Residual Effects and Monitoring

310. There will be no significant residual effects following mitigation.

6.12 Summary EIA Impact Matrix

Receptor	Distance & Direction	Sensitivity	Comments	Magnitude	Significance	Positive/Neutral/Adverse
Aviation						
ATC Tower	600m	High	No mitigation necessary	Negligible	Negligible	Neutral
Approach to Runway 08	2-miles	High	No mitigation necessary	Low	Minor	Adverse
Approach to Runway 26	2-miles	High	No mitigation necessary	Low	Minor	Adverse

6.13 EIA Mitigation Matrix Table

Stage during the development	Receptor	
	Aviation Receptors	
	ATC Tower	Approach Paths
During Construction.	No impact.	Negligible. (the layout and panels characteristics have been optimised to reduce the effect significance to acceptable levels)
During Operation (long term).	No impact.	Negligible. (the layout and panels characteristics have been optimised to reduce the effect significance to acceptable levels)

6.14 Summary and Conclusion

311. Significant impacts are not predicted as a result of the Proposed Development subject to the proposed mitigation measures being implemented and that residual impacts will not be significant.
312. The glint and glare assessment attached to this document (Document Ref: R008) has considered Aviation safety;
313. These receptors were assessed considering the applicable guidance and industry best practice.
314. The analysis has shown that:
Aviation receptors, after a layout optimization the impact upon aviation receptors is categorised as follows:
- ATC Tower: “**Negligible Adverse**” effect (no impact).
 - Approach Paths: “**Minor Adverse**” effect (no impact).
315. The developer is committed to mitigate issues related to these receptors with forms of mitigation which will reduce the impact to “Negligible Significance”.

6.15 References

- [1] Renewable and low carbon energy, Ministry of Housing, Communities & Local Government, date: 18 June 2015, accessed on: 17/06/2020.
- [2] Solar Glare Hazard Analysis Tool (SGHAT) Technical Reference Manual, Clifford K. Ho et al, date: March 2015, accessed on: 17/06/2020.

7 Other Considerations

7.1 Introduction

316. This chapter pulls together the remaining outstanding issues to be addressed in the Environmental Statement (ES), namely:
- Climate change and sustainability;
 - Accidents or disasters;
 - EIA flexibility; and
 - The Mitigation Schedule.

7.2 Climate Change and Sustainability

317. With regards to vulnerability to climate change, the solar arrays are designed to capture the sun's energy and therefore built to withstand extreme climatic conditions and are purposefully located in open locations. The Site is not located within a coastal location and as such is not at risk to any changes to the sea level. The sensitive infrastructure on the Site such as the substation and battery storage areas have been located in low risk flood areas and the Proposed Development has been designed to not increase the risk of flooding.
318. The UK Government has set ambitious targets for reducing greenhouse gas emissions by 2050. The Proposed Development will contribute to the UK's aims to reduce carbon emissions and achieve Net Zero. When operational, the Proposed Development will generate electricity from a renewable source and export this to the National Grid. The proposed battery facility will help balance the supply of electricity to the grid and improve the efficiency of the solar farm.
319. The Proposed Development would supply up to 49.9MW to the National Grid, providing the equivalent annual electrical needs of approximately 15,600 family homes in Hertsmere. The anticipated CO₂ displacement is around 25,400 tonnes per annum, which represents an emission saving equivalent of a reduction in c.8,100 cars on the road every year. It is also estimated the solar farm will increase the total amount of renewable electricity generated in Hertsmere from 5.4% to 20%, bringing Hertsmere closer to the national average of 33% electricity generated from renewable sources.
320. It would make a valuable contribution to the generation of electricity at a local level. The generation of electricity from the Proposed Development will displace the generation of electricity from other conventional power sources, typically oil, coal or gas-fired electricity production as these, and will help meet the growing demand for electricity.

7.3 Accidents or Disasters

321. The ES should include a description and assessment of the likely significant effects resulting from potential accidents or disasters applicable to the development proposal. Specific consideration to risk to aviation safety from the nearby Elstree Aerodrome has been addressed specifically in Chapter 6 of the ES and in the Glint and Glare assessment in the ES Technical Appendices (see Document Ref: R008). The Proposed Development is not considered likely to cause a significant accident or disaster risk during either the construction, operation or decommissioning phases.
322. The risk both to construction workers and the general public is low and not significant during the construction and decommissioning phases. This would be regulated by the Health and

Safety Regulations and the Construction (Design and Management) Regulations 2015. The construction of the Proposed Development would be managed in accordance with the Health and Safety at Work Act 1974 and would comply with all other relevant Health and Safety Regulations, including the Construction (Health, Safety and Welfare) Regulations 1996 and Electricity Safety, Quality and Continuity Regulations 2002.

323. When operational the majority of the Proposed Development comprises solar modules which are inert. Electrical infrastructure will be located across the Proposed Development, in the form of inverter/transformer stations and cabling, all of which will be subject to a routine maintenance regime. Fire suppression systems are integrated to each battery container. Accordingly, it is not considered to pose a significant risk of creating an accident or disaster.
324. Overall, no potential has been identified for the Proposed Development to lead to increased risk of a major accident or disaster in isolation or in combination with cumulative developments or emerging Local Plan allocated sites.

7.4 EIA Flexibility

325. Due to the rapid pace of technological development in solar, it is necessary to provide flexibility in the description of development to allow the most up to date technology possible to be utilised by the development at the time of construction, operation and decommissioning.
326. The design principles set out in Chapter 3 of this ES and the Design and Access Statement (Document Ref: R004) form the Rochdale Envelope limits within which the development can be built and operated. The design principles set out represent the worst-case design parameters, for example, solar modules are likely to become more efficient, meaning less are required or they may reduce in size meaning that more are required to cover the same area.

7.5 Mitigation Schedule

327. This Mitigation Schedule summarises the mitigation measures identified in the Environmental Statement. It does not include “embedded mitigation” or “development design” mitigation i.e. that which forms part of (or is “embedded in”) the Proposed Development design.
328. The embedded mitigation measures are described in Chapter 6 and the Technical Appendices and include orientation of panels and angle of tilt of the panels as outlined in the DAS (see Document Ref: R004).
329. Table 12 below provides a summary overview of the mitigation upon which assessments within this ES have relied.

ES Chapter	Phase of Development	Mitigation	Where Secured
Aviation Safety	During Construction.	Landscape screening	LEMP (Document Ref R009) and LEEP Plan
Aviation Safety	During Operation (long term).	Landscape screening	LEMP (Document Ref R009) and LEEP plan

Table 12: Schedule of Mitigation

8 Glossary

Acronym/term	Full term/Definition
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near (LAeq,T).
AOD	Above Ordnance Datum (Ordnance Datum Newlyn)
AONB	Area of Outstanding Natural Beauty
[the] Applicant	Elstree Green Limited
Application Boundary	The entire red line boundary comprising all elements of the Proposed Development
ATC	Air Traffic Control
AVR	Accurate Visual Representation
BAP	Biodiversity Action Plan
Battery Storage	Facility to store and supply power to the local distribution network at times of peak electrical demand
BS	British Standard
CIEEM	Chartered Institute of Ecology and Ecological Management
CO ₂	Carbon Dioxide
COPA 1974	Control of Pollution Act 1974 (as amended)
CROW 2000	Countryside and Rights of Way Act 2000 (as amended)
CTMP	Construction Traffic Management Plan
CWS	County Wildlife Site
DAS	Design and Access Statement
Daytime	The period 07:00-23:00 hours
dB	Decibel - A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by $20 \log_{10} (s1/s2)$.
dB(A), LAx	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A)
DBA	Desk Based Assessment
DC	Direct Current

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Acronym/term	Full term/Definition
EA	Environment Agency
EcIA	Ecological Impact Assessment
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
FFL	Finished Floor Level
Filtered Views	A view which is partially obscured by another object, for example a view through a tree canopy
FRA	Flood Risk Assessment
Framed Views	A view that is restricted and bordered by objects located at the sides of the view; for example a view along a street which is bordered at both sides by buildings
GCN	Great Crested Newt
Glimpsed Views	A view which is seen or perceived briefly or partially, for example when the viewer is moving
GLVIA3	Guidelines for Landscape and Visual Impact Assessment (3rd Edition, 2013)
Grid Connection Route	the route of the Electrical Connection from the proposed substation on the Site to the National Grid Substation at Elstree
GW	Gigawatt
Ha	Hectare(s)
HBC	Hertsmere Borough Council, the Local Planning Authority for the Proposed Development planning application
HCC	Hertfordshire County Council
HER	Historic Environment Record
HGV	Heavy Goods Vehicle – vehicle with two or more axles over 3.5 tonnes – includes RCVs, rigid and articulated trucks
IEA	Institute of Environmental Assessment, now IEMA
IEMA	Institute of Environmental Management and Assessment
km	Kilometre
LCA	Landscape Character Area
LDV	Light Duty Vehicle - vehicles with 2 axles and a maximum gross weight of 3.5 tonnes – includes large vans, caravans and cars with trailers
LI	Landscape Institute
LLFA	Lead Local Flood Authority

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Acronym/term	Full term/Definition
LMGB	London Metropolitan Green Belt
LNR	Local Nature Reserve
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	Metre
MAGIC	Multi Agency Geographic Information for the Countryside
MW	Megawatt
National Grid	Company which owns the National Electricity Transmission Network
NE	Natural England
Night-time	The period 23:00-07:00 hours.
NPPF	National Planning Policy Framework
NPS EN-1	National Policy Statement - Overarching NPS for Energy
NPSE	Noise Policy Statement for England
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary of the ES
Oblique Views	A view which is not seen or experienced in a direct way or angle; for example a view which is at a different angle to the main direction of the viewer's travel and therefore requires the head to be turned to perceive the view, and is not the main focus for that person
Open Views	A view with no restrictions, not closed or blocked or framed
OS	Ordnance Survey
PA 2008	Planning Act 2008 (as amended)
Point of Connection	Elstree Substation
PPG	Planning Practice Guidance (online)
Proposed Development	The whole of the Proposed Development comprising the Hilfield Solar Farm and Battery Storage for which planning permission is sought including the grid connection
PRoW	Public Right of Way
PV	Photovoltaic
RHPG	Registered Historic Parks and Gardens
SAC	Special Area of Conservation
SINC	Site of Importance for Nature Conservation
Site	All the land within the Application Boundary

Acronym/term	Full term/Definition
SM	Scheduled Monument
SPA	Special Protection Area
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
Statement of Community Involvement	Report which discusses the entire pre-application consultation process, detailing how regard has been had to all comments received, and how comments may have shaped and influenced the proposals for the Proposed Development
SuDS	Sustainable Drainage Systems
TA	Transport Assessment
TP	Travel Plan
VP	Viewpoint
ZTV	Zone of Theoretical Visibility