

SIX OAKS RENEWABLE ENERGY PARK

Environmental Statement Volume 2A - Written Statement

PREPARED ON BEHALF OF

Six Oaks Renewable Energy Park Limited

OCTOBER 2022



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PREFACE

This Written Statement forms the second part of a four volume, five part Environmental Statement which describes the findings of the Environmental Impact Assessment (EIA) of the proposed Six Oaks Renewable Energy Park. The volumes of the complete document are:

Document	Title	Contents
Volume 1	Non-Technical Summary	Summarises the proposal and the key conclusions of the EIA for the non-technical reader
Volume 2A	Written Statement	Presents the full assessments of the EIA
Volume 2B	Appendices	Presents the appendices referred to in the Written Statement
Volume 3	Figures	Presents the figures referred to in the Written Statement
Volume 4	Visualisations	Presents the visualisations referred to in the Landscape and Visual Impact Assessment (LVIA) within the Written Statement

In addition to the Environmental Statement, the Applicant has submitted a Planning Statement which summarises the planning policy context of the proposal including summaries from other assessments (where not likely to have significant effects). A Design and Access Statement as well as a supporting Socio Economics Statement, Statement of Community Involvement, Transport Statement and environmental assessments undertaken outside of the EIA regulations also accompany the planning application.

A complete set of application documents can be viewed in person at East Cambridgeshire District Council, The Grange Car Park, Nutholt Lane, Ely CB7 4EE or South Cambridgeshire District Council, South Cambridgeshire Hall, Cambourne Business Park, Great Cambourne, Cambourne, Cambridge CB23 6EA or downloaded from the project website, as detailed in the box below.

Printed copies can be purchased at a cost of £500+VAT or digital versions, either as a download or on a USB stick free of charge.

To order copies, please contact Engena Limited at:

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The Applicant may also be contacted at:

<https://ridgecleanenergy.com/sixoaks/>

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The background of the page is a photograph of a large array of solar panels installed in a field. The panels are tilted and arranged in rows, with a grassy area visible in the foreground. The image is slightly faded to allow the text to be read clearly.

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SIX OAKS RENEWABLE ENERGY PARK

Introduction

- 1.1 The Six Oaks Renewable Energy Park proposal (the Proposal) consists of;
- an array of ground-mounted solar panels and ancillary infrastructure including inverters (mounted behind the panels), transformer

- units, access tracks, security fencing and infrared cameras, electrical and communications infrastructure;
 - a Battery Energy Storage System (BESS) including battery units mounted in containers, power conversion and transformer units, switchgear containers, access tracks, security fencing and infrared cameras; and
 - substation compound comprising a DNO Control Room, Solar and BESS Substation Container, electrical infrastructure (including transformers, standby cooling generator) busbars and isolation equipment, access tracks, security fencing and infrared cameras.
 - A temporary construction compound will be located to the south east of the development area (just above the BEES/ Substation) for the duration of construction and a grid connection cable will connect the site to the local electrical distribution network (subject to a separate consenting process).
- 1.2 The Proposal would have an installed AC capacity of up to 49.9MW.
- 1.3 The project could host up to 100MWh of BESS (Battery Energy Storage System), that is discharging at 50MW over two hours.
- 1.4 It is anticipated that the Proposal would be generating electricity for a period of forty (40) years.
- 1.5 For the purposes of the Environmental Impact Assessment and this Environmental Statement, assessments for impacts of the solar farm have been primarily based upon panel rows with a maximum height of up to 3.0m angled at around 20-25 degrees facing south.
- 1.6 The site is located between the A14 and A11 approximately 1.4km east-south-east of Bottisham. The location of the proposed site is shown at **Figure 1.1**, the layout is shown at **Figure 1.2** and is overlaid on aerial imagery at **Figure 1.3 of ES Volume 3**.

Energy Production

- 1.7 It is currently estimated that the Proposal will be sufficient to offset the equivalent annual electricity needs of approximately 10 700 East Cambridgeshire homes (based on average domestic consumption per household of 4 540kWh (DBEIS, 2022)) - all figures to 3 Significant Figure (3 S.F.).

Carbon Offset

- 1.8 From the displacement of electricity generated from fossil fuels powered generation, the Proposal would offset the emission of a significant quantity of pollutants, particularly carbon dioxide, into the atmosphere. This reduction in emissions would contribute to the national legislation of net zero carbon emissions by 2050, the commitment of the UK Government to decarbonise energy supply by 2035 and international reductions required under the legally binding obligations of the Kyoto Protocol and Paris Agreement. It also contributes to the reduction of emissions in East Cambridgeshire District Council's

area, thereby supporting the Council's declared Climate Emergency.

- 1.9 As discussed further in **Chapter 8 - Construction, Operation and Decommissioning**, on a conservative basis (DBEIS, 2022) the electricity produced by the Six Oaks Renewable Energy Park will offset the equivalent of approximately 9 430 tonnes of CO₂ per annum.
- 1.10 Six Oaks Renewable Energy Park would make a material contribution to net zero, helping to meet the National need reducing dependency on fossil fuels.

The Applicant

- 1.11 The Applicant for the Proposal is Six Oaks Renewable Energy Park Limited.
- 1.12 Six Oaks Renewable Energy Park Ltd is a project company owned by Ridge Clean Energy Ltd, a well-funded, UK-based clean energy company whose team have developed, constructed and operated clean energy projects in the UK since 2003. They have a significant portfolio of renewable energy projects of various renewable technologies, totalling over 1GW across projects throughout the UK.

- 1.13 Engena Limited is an independent planning consultancy with over 1GW of development experience in the renewable energy industry, specialising in project planning, development management and Environmental Impact Assessment (EIA). Engena is supporting Ridge Clean Energy Limited with the provision of planning services.

REFERENCES

Department for Business, Enterprise and Industrial Strategy (DBEIS), 2022, Sub-National Electricity Consumption Statistics, retrieved from: <https://www.gov.uk/government/statistical-data-sets/regional-and-local-authority-electricity-consumption-statistics>.

United Nations, 1998, Kyoto Protocol to the United Nations Framework Convention on Climate Change.

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INTRODUCTION

2.1 This chapter sets out the wider international, national, regional and local context within which the Six Oaks Renewable Energy Park is proposed. The merits of the various forms of renewable energy are also considered, along with the current and future energy generation mix of the UK.

2.2 The imperative need to reduce the carbon dependence of the economy is also discussed against the various alternative energy solutions.

GLOBAL CLIMATE CHANGE

2.3 It is internationally accepted that global warming and its association with climate change effects are a reality. Scientific opinion has converged on the appreciation that human activity, including the burning of fossil fuels, is rapidly changing the Earth's climate.

2.4 The Intergovernmental Panel on Climate Change (IPCC) was set up in 1988 by the World Meteorological Organisation and the United Nations Environment Programme to: 'assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human induced climate change, its potential impacts and options for adaptation and mitigation' (IPCC, 1998).

2.5 The IPCC is split into three working groups:

- Working Group 1: The Physical Basis of Climate Change;
- Working Group 2: Climate Change Impacts, Adaptation and Vulnerability; and
- Working Group 3: Mitigation.

2.6 Each Working Group is responsible for the publication of its own findings, and the IPCC are organised such that the Working Groups report their findings in order. Upon completion of each report an overarching 'synthesis' report is produced, which integrates the findings of the three groups.

2.7 The Working Groups publish in approximately 5-7 year cycles. The latest synthesis report provides the contribution of Working Group I (WGI) to the IPCC's Sixth Assessment Report, AR6, 'Climate Change 2021 The Physical Science Basis', and was published on 7th August 2021 (IPCC, 2021).

2.8 The findings of the Working Groups are clear and unequivocal, and as the IPCC assessments have progressed up to the present Assessment, the uncertainty levels have decreased.

Working Group 1: The Physical Basis of Climate Change

'It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.' (Paragraph A.1; IPCC, 2021).

2.9 It was reported by the IPCC in AR6 that each of the last four decades have been successively warmer than any decade that preceded it since 1850. Between 1850 and 2019 it is likely that humans have caused global surface temperature to increase by 1.07°C; a rate that is unprecedented in at least the last 2000 years.

2.10 Not only is the rate of change unprecedented but also the scale of recent changes is unlike anything previously seen:

- globally averaged precipitation over land has likely increased since 1950, with a faster rate of increase since the 1980s and human influence extremely likely to have contributed to the changes in near-surface ocean salinity;

- mid-latitude storm tracks have likely shifted poleward in both hemispheres since the 1980s;
- glaciers have retreated across the globe and this is very likely the result of human influence. It is also very likely that human activity has contributed to less snow cover since 1950 in the Northern Hemisphere and surface melting of the Greenland Ice Sheet over the last 20 years;
- it is virtually certain that the global upper ocean has warmed since the 1970s;
- the rate of change of global sea level rise has almost tripled between 1901-1971 and 2006-2018;
- climate zones have shifted poleward in both hemispheres, and the growing season has increased by up to two days per decade since the 1950s;
- it is virtually certain that hot extremes have become more frequent and more intense across most land regions since the 1950s, while cold extremes have become less frequent and less severe;

- marine heatwaves have approximately doubled in frequency since the 1980s;
- tropical cyclone occurrence has likely increased over the last four decades and the location of peak intensity has shifted northwards - patterns that are not explainable by internal variability; and
- human influence has likely increased the chance of compound extreme events since the 1950s. This includes increases in the frequency of concurrent heatwaves and droughts on the global scale (high confidence); fire weather in some regions of all inhabited continents (medium confidence); and compound flooding in some locations (medium confidence).

2.11 It is likely to very likely that human influence is a key driver for all of these effects.

2.12 AR6 reaffirms the conclusions of AR5 that at least net zero CO₂ and strong reductions in other greenhouse gas emissions are required in order to stabilise human-induced global warming. Five new possible

climate future scenarios have been considered across AR6 to explore the broader range of greenhouse gas, land use and air pollutant futures than addressed in AR5. These scenarios are illustrated in **Plate 2.1**.

- 2.13 SSP1-1.9 and SSP1-2.6 are scenarios that start in 2015 and have very low and low GHG emissions and CO₂ emissions declining to net zero around or after 2050, followed by varying levels of net negative CO₂ emissions.
- 2.14 SSP2-4.5 is the intermediate emissions scenario, and SSP3-7.0 and SSP5-8.5 are the high to very high greenhouse gas emissions scenarios.
- 2.15 As shown at **Plate 2.1**, compared to 1850-1900, global surface temperature averaged over 2081-2100 is very likely to be: 1.0-1.8°C higher under the very low greenhouse gas emissions scenario (SSP1-1.9); 2.1-3.5°C higher under the intermediate greenhouse gas emissions scenario (SSP2-4.5); and 3.3-5.7°C higher under the very high greenhouse gas emissions scenario (SSP5-8.5).

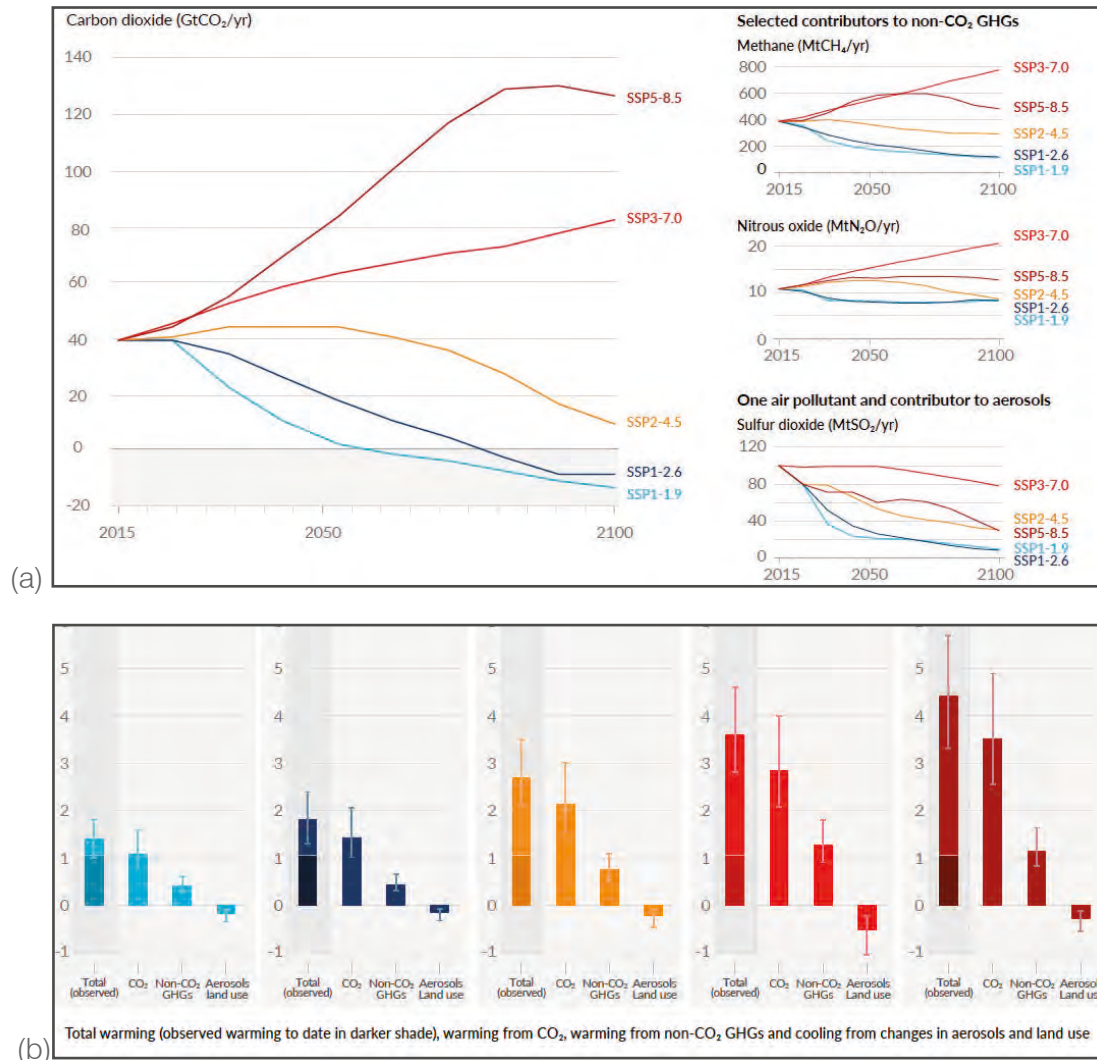


Plate 2.1 - (a) Future Annual Emissions of CO₂ (left) and of a Subset of Key Non-CO₂ Drivers (right) across Five Illustrative Scenarios; (b) Contribution to Global Surface Temperature Increase from Different Emissions, with a Dominant Role of CO₂ Emissions (IPCC, 2021)

2.16 As shown by **Plate 2.1 on page 17**, the scale of the challenge over the next two decades cannot be underestimated. However, this challenge must be achieved. Global warming must be limited to 1.5°C as soon as possible or the effects will become irreversible.

Working Group 2: Impacts, Adaptation and Vulnerability

2.17 The impacts of the greenhouse effect on global temperatures and global climates are now apparent. The consequences of increased temperatures on rising sea levels and decreases in the ice mass, snow precipitation and ice cover are regularly reported. Working Group 2 have found that evidence of climate change impacts is strongest and most comprehensive for natural systems. However, impacts on human systems have also been attributed to climate change (IPCC, 2014).

2.18 Changing precipitation, and melting snow and ice are affecting water resources (quality and quantity). Many terrestrial, freshwater and marine species have shifted their ranges, migration patterns and interactions

in response to climate change. It has also been found that negative impacts of climate change on crop yields have been more common than positive impacts. There has been increased heat related mortality and decreased cold related mortality in some regions as a result of warming, and local changes in temperature and rainfall have altered the distribution of some water borne illnesses and disease vectors.

2.19 Within the Fifth Assessment Report, Working Group 2 also considered evidence relating to the socio-economic impacts associated with climate change. They found that people who are socially, economically, culturally, politically, institutionally or otherwise marginalised are especially vulnerable to climate change and are also vulnerable to some adaptation and mitigation responses.

2.20 With a *very high confidence* level, Working Group 2 have found that impacts from climate related extremes (e.g. heat waves, droughts, floods, cyclones, wildfires) reveal *significant* vulnerability and exposure of some ecosystems and many human systems to current climate variability.

2.21 Impacts of such climate-related extremes include alteration of ecosystems, disruption of food production and water supply, damage to infrastructure and settlements, morbidity and mortality, and consequences for mental health and human well-being. For countries at all levels of development, these impacts are consistent with a significant lack of preparedness for current climate variability in some sectors.

2.22 For Europe, the key risks associated with climate change have been identified as:

- increased economic losses and people affected by flooding in river basins and coasts, driven by increasing urbanisation, increasing sea levels, coastal erosion and peak river discharges;
- increased water restrictions. Significant reduction in water availability from river abstraction and from groundwater resources, combined with increased water demand (e.g. for irrigation, energy and industry, domestic use) and with reduced water drainage and runoff as a result of increased evaporative demand, particularly in southern Europe; and

- increased economic losses and people affected by extreme heat events: impacts on health and well-being, labour productivity, crop production, air quality, and increasing risk of wildfires in southern Europe and in the Russian boreal region.

2.23 It is reported that adaptation can prevent most of the projected damages associated with flooding. However, it is recognised that this will come at a high economic cost and will raise environmental and landscape concerns/objections.

2.24 By way of recent example, there have been a number of devastating floods across the UK in recent years. In December 2013, when floods hit large parts of southern England, it emerged afterwards that one of the villages flooded in the south-east had previously refused the offer of a flood defence due to aesthetic impacts on the village (Guardian, 2013).

2.25 More recently during the floods across Shropshire, Worcestershire and Yorkshire in February 2020, flood barriers holding back the River Severn at Ironbridge buckled as river levels nearby peaked at 6.0m.

It was reported that '*permanent flood defences are not a feasible option in a place like Ironbridge - its special historic and scientific significance means that temporary barriers are a better alternative*' (BBC News, 2020). The temporary defences were pushed back 2.0m by flood water. Again, this highlights an adaptation issue which will likely be encountered more regularly in coming years - the balance between the protection of important assets and communities against the need for permanent flood defences and their associated impacts.

2.26 Conversely, adaptation methods to address water restrictions and losses associated with extreme heat events largely require the adoption of a different approach to current practices. This includes the use of more water efficient technologies, adaptation of dwellings, and (pertinent to this project) reductions in emissions to improve air quality.

Working Group 3: Mitigation of Climate Change

2.27 Despite attempts to mitigate climate change, so far greenhouse gas emissions have continued to increase at an accelerated pace. Working Group 3 considered energy supply, transport, buildings, industrial processes, agriculture, forestry and spatial planning. Their report concluded that all sectors need to substantially reduce greenhouse gas emissions if we are to limit global warming to 2 degrees Celsius.

2.28 The reason for the accelerated increase in emissions is largely put down to increased use of fossil fuels in the energy and industry sectors. This is of particular concern for emerging economies who produce consumer goods for established economies.

2.29 The '*do nothing*' scenario would result in 4 degrees of global warming by the end of this century.

2.30 To prevent this, emissions need to be halved by 2050, and further after that. If emissions are not falling by 2030 it is twice as likely that we will not achieve this goal (IPCC, 2014). As

a result, the IPCC are recommending a substantial increase in low carbon energy prior to 2030, amongst other measures in different sectors. To achieve this, an increase in renewable energy supply is required, along with increases in nuclear energy and technological advances in large scale carbon capture and storage.

2.31 Whilst these measures are absolutely essential to limit global warming, they remain ambitious. The current baseline scenarios are expecting the emissions associated with energy supply to double or even treble by 2050. To achieve the reductions necessary, the low carbon electricity sector needs to increase from 30% of demand worldwide to 80% by 2050 (IPCC, 2014).

IPCC Special Report - Global Warming of 1.5 degrees, 2018

2.32 In between the usual 5-7 year cycle of IPCC Synthesis studies, the IPCC were invited by the United Nations Convention on Climate Change to produce a special report on the impacts of global warming of 1.5 degrees above pre-industrial levels, contained in the Decision of the 21st

Conference of Parties of the United Nations Framework Convention on Climate Change to adopt the Paris Agreement.

2.33 The IPCC reported that:

'Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate (high confidence)' (IPCC, 2018).

2.34 Of most alarm, it was reported that since Kyoto, global carbon dioxide emissions have continued to rise. If this trend continues, then a 1.5°C rise will occur before 2040.

2.35 In the short space of three years between the Special Report and publishing of the IPCC's Working Group I (WGI) contribution to the Sixth Assessment Report (AR6) (Climate Change 2021), the situation is more certain:

- *'climate change is already affecting every inhabited region of the world, be this through hot extremes, heavy rain or drought'*;

- *'global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO₂ and other greenhouse gas emissions occur in the coming decades'*;
- *'with every increment of global warming, changes get larger in regional mean temperature, precipitation and soil moisture'*;
- *'projected changes in extremes are larger in frequency and intensity with every additional increment of global warming'*; and
- *'continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events'*.

2.36 However, the IPCC also report that reaching and sustaining net zero global anthropogenic CO₂ emissions as well as reducing non-CO₂ emissions would halt anthropogenic global warming on multi-decadal timescales in the short term. In the longer term, there is a need to go further and not only sustain net zero emissions

but establish net negative CO₂ emissions. This is to prevent further warming from feedback loops caused by the initial warming event (such as the release of methane caused by the melting of Arctic permafrost), and to reverse ocean acidification and minimise sea level rise.

2.37 Internationally, the Special Report has attracted a great deal of attention, particularly by the younger generation inspired by youth campaigner Greta Thunberg. This in turn has led to declarations of Climate Emergencies by nations, including the UK, and local authorities.

2.38 A Climate Emergency was declared by the UK Parliament on 1st May 2019, this was followed by a significant number of local government bodies. To date 337 local authorities have now declared a climate emergency (climateemergency.uk, 2022). East Cambridgeshire District Council signed the climate emergency on 19th October 2019. The regional and local context is discussed further from **Paragraph 2.42 on page 22**.

Climate Change in the UK

2.39 An annual UK weather and climate report entitled 'State of the UK Climate' is produced every July by the Met Office and published by the Royal Meteorological Society. The latest, published in July 2021 (Kendon, et al., 2021), found that:

'Year 2020 was third warmest, fifth wettest and eight sunniest on record for the UK. No other year has fallen in the top-10 for all three variables for the UK.'

2.40 The State of the UK Climate report also found:

- *2020 was the third warmest year for the UK in a series from 1884;*
- *all the top 10 warmest years for the UK in the series from 1884 have occurred since 2002;*
- *2020 was the seventh consecutive year where the number of air and ground frosts was below the 1981–2010 average;*
- *heating degree days in 2020 were fifth lowest, and cooling and growing degree days equal-ninth/eighth highest, respectively for the UK in series from 1960;*

- *2020 was the UK's fifth wettest year in a series from 1862. 2020 also included the fifth wettest winter [and] the fifth driest spring;*
- *widespread and substantial snow events have occurred in 2018, 2013, 2010 and 2009, but their number and severity have generally declined since the 1960s; and*
- *2020 was the eighth sunniest year for the UK in a series from 1919, with 109% of the 1981–2010 average and 113% of 1961–1990 average sunshine hours.*

2.41 **Plate 2.2 on page 22**, produced by the University of Reading (Hawkins, 2020) and using UK Met Office Data illustrates the average annual UK temperature since 1884. Blues represent cool average temperatures, and reds represent warm average temperatures. The increase in average annual temperature is abundantly clear.

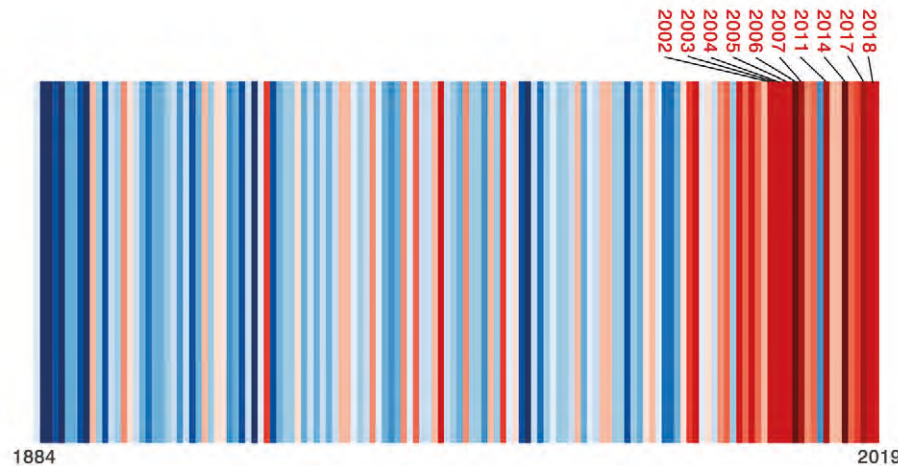


Plate 2.2 - UK Annual Temperature (Hawkins, 2020)

Regional Context

- 2.42 The Six Oaks Renewable Energy Park is located within East Cambridgeshire.
- 2.43 There have been a number of regionally focused strategy's on climate change. In July 2019, Cambridgeshire County Council and Peterborough City Council published the Cambridgeshire and Peterborough Corporate Energy Strategy.
- 2.44 The vision of this strategy is to;
Secure renewable and resilient energy supplies and infrastructure that can

support local needs. We will do this whilst maximising commercial benefit for the Councils and our communities and making best use of our combined assets to reduce carbon impacts emissions and environmental impacts.

- 2.45 There are Six Strategic Focus Areas with the strategy which are as follows;
 - Low Carbon Energy - which includes maximising the use of renewables;
 - Local Generation and Supply - which includes developing local energy supplies outside of the influence of global market changes;

- Energy Efficiency - through service redesign and policy development;
- Managing Cost - which includes working in partnership to procure local carbon energy;
- Generating Income - through selling locally produced energy; and
- Sustainable Growth - which includes supporting growth of new technologies to balance energy demand and supply.

2.46 The strategy recognises Solar PV as one of the main renewable energy opportunities and how this might be applied in Cambridgeshire and Peterborough.

2.47 The Strategy states;
It is the strongly held view, supported by the Cambridge and Peterborough Independent Economic Review (CPIER), that energy infrastructure is a key strategic priority for growth. Aside from clear environmental and community benefits, energy infrastructure is required to support the growing population, new housing developments, business growth and to provide high quality jobs for the region.

2.48 The combined authority of Cambridgeshire and Peterborough also convened to produce The Cambridgeshire and Peterborough Climate Action Plan 2022-2025.

2.49 The Action Plan seeks to address the following areas:

- Reducing Inequalities;
- Health and Skills;
- Climate and Nature;
- Innovation;
- Infrastructure; and
- Finance.

2.50 With respect to Climate and Nature and Infrastructure, the Action Plan has the following targets;

£1m fund to delivering nature-based solutions to climate problems (that also help restore biodiversity);

Link climate action with local nature recovery;

£1.5m funding for local demonstration projects on biodiversity and chalk streams to show how different benefits can be combined;

An ambition for a 20% increase in biodiversity from new developments;

Putting plans in place to ensure our energy systems generate and deliver renewable energy;

More investment in a transport system that provides great walking, cycling, and low carbon public transport. Support the shift to electric vehicles;

Investing in new infrastructure to maintain water supplies and biodiversity; and

Improving our flood resilience and helping local communities take action.

2.51 As stated in **paragraph 2.38 on page 21** East Cambridgeshire District Council declared a Climate Emergency in October 2019.

2.52 In June 2020 the Council published an Environmental Plan. This plan highlighted the steps put in place to help reach its goal of being a 'carbon net zero' authority by 2040 or earlier. This is further discussed from **paragraph 2.106 on page 30**.

CLIMATE CHANGE POLICY

International

2.53 Against the backdrop of evidence of global warming induced climate change, in 1992 the United Nations (UN) concluded that the impact of climate change was so serious that it was necessary for member nations to agree to a reduction in greenhouse gases. The United Nations Convention on Climate Change took place at the Rio Earth Summit. Following detailed cross-nation dialogue a treaty was agreed. The treaty came into effect in 1994.

2.54 The Kyoto Protocol was drawn up in 1997 to implement the UN Convention on Climate Change. Industrialised nations made the commitment to reduce their emissions of greenhouse gases by an average of 5.2% of 1990 levels during the period 2008-2012.

2.55 To reach a legally binding status, the Kyoto Protocol required the commitment of enough nations to account for at least 55% of the 1990 levels of greenhouse gas emissions. With the Russian government's

assent to the Agreement in 2004, the Kyoto Protocol was ratified in 2005 and became legally binding on those signatory nations. Countries accounting for over 63% of global CO₂ emissions have now signed to the agreement, binding 192 Countries plus the European Community as a regional member to the protocol.

- 2.56 If any of the Countries failed to meet their 2012 target, then the Protocol legally required them to make up the difference during the second commitment period after 2012 plus an additional 30% reduction penalty. All countries that participated in the first commitment period met their obligations.
- 2.57 Since Kyoto, the member states have regularly met to discuss progress at the Conference of the Parties (COP).
- 2.58 The second commitment period was negotiated in December 2012 at COP18 in Doha. Not all of the industrialised parties of the first commitment period committed to the second. However, the actions of the EU, Australia and Norway in committing to the second period ensured that the Kyoto Agreement remains in force. Of significance, COP18 also agreed to

provide developing countries with the assurance of funds to repair the 'loss and damage from climate change' (UNFCCC, 2012).

- 2.59 As of October 2020, 147 states have accepted the Doha Amendment. For the amendment to come into force, it needs to be accepted by 144 states. As such, the Amendment entered into force on 31st December 2020.
- 2.60 Negotiations for the post-2020 period resulted in the adoption of the Paris Agreement, which is a separate UN instrument rather than an amendment of Kyoto.

The Paris Agreement

- 2.61 The Paris Agreement is arguably the most significant UN Framework Convention on Climate Change agreement since Kyoto.
- 2.62 It was negotiated by 196 states at COP21 near Paris and adopted on 12th December 2015. All UNFCCC members have signed the agreement and 189 have become party to it.
- 2.63 In line with the IPCC Special Report discussed from **Paragraph 2.32 on page 20**, the long-term temperature goal of the Paris Agreement is to limit

the global average temperature rise to 'well below 2 degrees Celsius above pre-industrial levels; and to pursue efforts to limit the increase to 1.5 degrees Celsius'.

- 2.64 The operational details of the Paris Agreement were agreed at COP24, Poland in 2018.

COP26 Summit

- 2.65 The 26th UN Climate Change Conference of the Parties (COP) summit took place in Glasgow from 31st October to 12th November 2021.
- 2.66 The UK Government in summarising the event (UK.GOV, 2021) state:
- The outcome includes a series of actions that all Parties are expected to take to accelerate their efforts. This includes:*
- *A stronger commitment to limit global temperature rises to 1.5 degrees, and greater acknowledgement of the latest science which reflects the urgent need to take action during this critical decade.*
 - *The text includes 'phase-down of unabated coal power' and*

'inefficient fossil fuel subsidies', as well as 'mid-century net zero'. This language has never been included in UN text before.

- Parties are expected to revisit their 2030 emission reduction targets in 2022 and, where necessary, strengthen them to bring them in line with the Paris Agreement temperature goal.

The UK Response

2.67 The United Kingdom have been at the forefront of climate change policy with the production of the first IPCC report and the formation of the UN Convention on Climate Change. From 1997, the 12% emissions reduction target required by the EU was extended by the Government to a national 20% emissions reduction by 2012. This was later reinforced through the announcement of the aspiration to reduce CO₂ levels by 60% of their 1990 levels by 2050.

Climate Change Act 2008

2.68 The Climate Change Act 2008 sets a legal duty on the Secretary of State to reduce greenhouse gas emissions

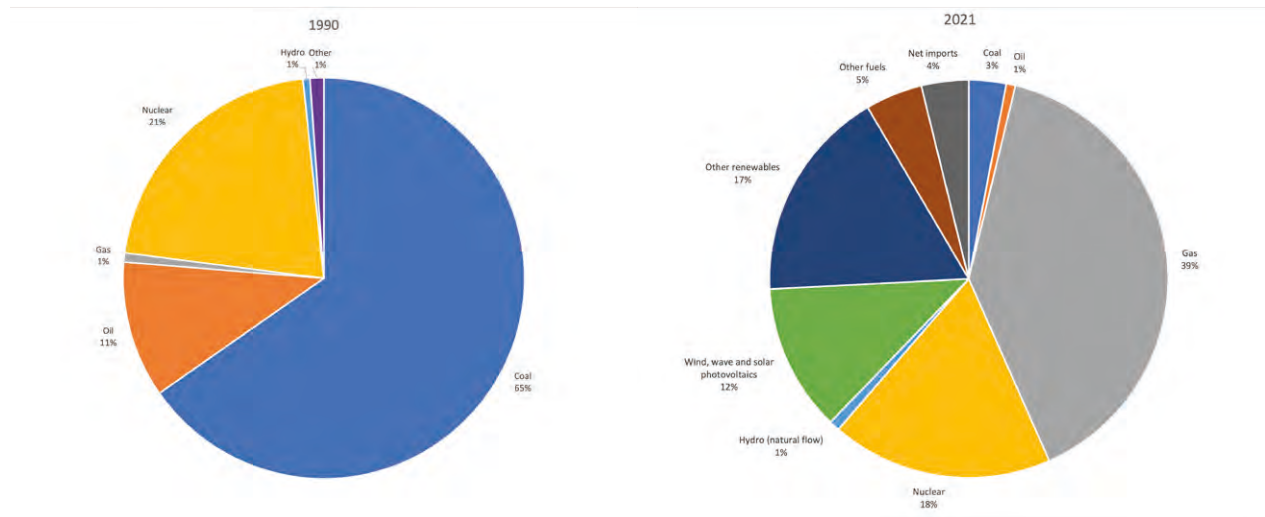


Plate 2.3 - 1990 Electricity Fuel Mix compared to 2020 Electricity Fuel Mix

(Source: Digest of UK Energy Statistics (DTI, 2000)(BEIS, 2022a)

by 2050. At the time of Royal Assent, the Act set the target for greenhouse gas emissions to be 80% lower than 1990 levels by 2050. The Act also set an interim target of a 34% reduction by 2020.

2.69 Through the Climate Change Act, the UK has made significant progress in the electricity sector. This is illustrated in **Plate 2.3** which compares the most recent fuel mix data (2020) to that of 1990.

2.70 This illustrates the significant decline of coal fired generation and the increase of renewable generation from near zero to 31% (14% wind, wave and PV; 14% other including thermal from waste). It also demonstrates an increased reliance on natural gas generation from 1% to 36%.

2.71 The success of the power sector is largely due to binding targets set through a mechanism called the Renewables Obligation (requiring 10% of generation to be from renewables

by 2010, 15% by 2015 and then 30% by 2020) and later Feed-in Tariffs and Contracts for Difference.

- 2.72 The Climate Change Act is managed through a series of rolling five year carbon budgets and associated interim targets. The Fifth Carbon Budget was passed in 2016. This recommended that annual emissions be limited to an average of 57% below 1990 levels by 2032.
- 2.73 The carbon budget is established by the Climate Change Committee, an independent body formed under the Climate Change Act to advise the UK and devolved Governments and Parliaments on tackling and preparing for Climate Change. The advice is considered by Parliament and, if accepted, the resultant targets are adopted.
- 2.74 The carbon budget is formed through careful consideration of cross-sector emissions including power, buildings, industry, transport, agriculture, land use, forestry, waste and fluorinated gases.
- 2.75 For the 2015 budget the Committee produced a specific power sector report entitled 'Sectoral Scenarios for

the Fifth Carbon Budget' (October 2015). This report found:

- up to 200TWh of new generation will be needed in the 2020s to replace generation from retiring coal and nuclear capacity and to meet increases in energy demand during this time. The 2020s are a crucial decade for the power sector;
- low carbon generation is likely to be cost-competitive and can be delivered without subsidy. This is true even when these projects face the full cost of intermittency; and
- low carbon options '*represent good value investments for a society committed to climate targets and are included in our scenarios: onshore wind and ground mounted solar from the first half of the decade and nuclear, offshore wind and potentially carbon capture and storage in the second half of the decade*'.

Net Zero

- 2.76 On 27th June 2019, the Government formally amended the target within the Climate Change Act as follows:

'It is the duty of the Secretary of State to ensure that the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline.'
- 2.77 The United Kingdom is the first member of the G7 group of industrialised nations to legislate for net zero emissions.
- 2.78 To put into context the challenge of meeting Net Zero, the Climate Change Committee report that the UK emissions were 44% below 1990 levels in 2018. The first (2008-2012) and the second (2013-2017) carbon budgets were met and the UK is on track to meet the third (2018-2022) carbon budget. However, the Country is not on track to meet the fourth, which covers the period 2023 to 2027.
- 2.79 The Committee report that:

'Meeting future carbon budgets and the UK's 2050 target to reduce emissions by at least 100% of 1990 levels will require reducing domestic emissions by at least 3% of 2018 emissions, that

- is 50% higher than under the UK's previous 2050 target and 30% higher than achieved on average since 1990. This is an indication of how substantial the step up in action must be to cut emissions in every sector' (CCC, 2019a).*
- 2.80 In their advice to Government on implementing a 100% net zero target, in May 2019 the Committee published 'Net Zero - The UK's contribution to stopping global warming' (CCC, 2019b).
- 2.81 This report recognises the foundations that are in place to deliver the previous 80% reduction target and describes the 'technically feasible but highly challenging' 'further ambitions' that must be achieved to reach 100% or Net Zero.
- 2.82 All sectors must play a role and it is recognised that societal changes addressing our habits and the way that we do things need to collectively happen to achieve Net Zero. These measures include:
- resource and energy efficiency;
 - societal choices to less carbon intensive activities, such as reduction in the consumption of meat;
- extensive electrification, particularly of transport and heating, supported by a major expansion of renewable and low carbon power generation;
 - development of a hydrogen economy;
 - Carbon Capture and Storage; and
 - better land use with more emphasis on carbon sequestration and biomass production.
- 2.83 The measures above require a doubling of electricity demand, with all power produced from low-carbon sources.
- 2.84 To set the path to Net Zero, the Climate Change Committee published 'Policies for the Sixth Carbon Budget and Net Zero' in December 2020 (CCC, 2020). The Committee state that this Sixth Budget is 'the most comprehensive advice we have ever produced'. The Sixth Budget became law under the Carbon Budget Order 2021 on 24th June 2021, in advance of the UK hosting the 26th Climate Conference, COP26.
- 2.85 As well as the most comprehensive, it is also their most ambitious. The recommended pathway requires a 78% reduction in UK territorial emissions between 1990 and 2035 – bringing forward the UK's previous 80% target by almost 15 years. Indeed, this meets the 'highest possible ambition' scenario of the Paris Agreement.
- 2.86 To set the economic context for the Sixth Carbon Budget, the Committee highlight how the economic and social context for climate action has changed in important ways since the UK set the 2050 Net Zero target. The COVID-19 pandemic has significantly changed the economic backdrop in the UK and globally. Employment, GDP and business investment have all fallen, despite record low interest rates. The Committee state that increasing investment in green jobs could support the UK's recovery.
- 2.87 This is in line with the Prime Minister's 10 Point Green Plan (HM Government, 2020), which amongst other things seeks to increase sustainable generation, and accelerate the shift to electric vehicles, green public transport and green buildings.
- 2.88 The Sixth Carbon Budget requires action across four key areas:
- Reducing demand for carbon-intensive activities (shifting diets away from meat and dairy;

reducing waste; slower growth in flights and travel demand; improved efficiency of buildings, vehicles and industry);

- Take up of low-carbon solutions (by the early 2030s all new cars and vans and all boiler replacements in homes and other buildings must be low carbon – largely electric; by 2040s all HGVs are to be electric or hydrogen powered);
- Expand low carbon energy supplies (low carbon electricity is now cheaper than high-carbon; electricity demand rises 50% to 2035, doubling or even trebling by 2050; low carbon hydrogen scales up); and
- Land (and removals) (planting of 440 000ha of mixed woodland; 260 000ha of agricultural land shifts to bioenergy production, including short rotation forestry; peatland restored and low carbon farming adopted. By 2035 bioenergy, using UK biomass, with Carbon Capture Storage will deliver removals of CO₂ at scale).

2.89 The Sixth Carbon Budget ties in with the Energy White Paper (December

2020), the Government Response to the Future Homes Standard (January 2021) (MHCLG, 2021a) and the 10 Point Green Plan. With all new cars and vans to be fully electric from 2030 and heating in new homes to be non-fossil from 2025, electricity demand is set to increase from c. 300TWh today, to 360TWh in 2030, 460TWh in 2035 and 610TWh in 2050. In addition to this, to produce hydrogen for transport, an additional 120TWh is required in 2050.

2.90 Renewable energy and battery storage (to manage variability) are key components of this drive. The Climate Change Committee's Net Zero scenario expects 80% of electricity to be supplied by renewable energy, of which wind will contribute 125GW and solar 85GW. Whilst the offshore resource will provide a significant portion of this, the Energy White Paper states that:

'Onshore wind and solar will be key building blocks of the future generation mix, along with offshore wind. We will need sustained growth in the capacity of these sectors in the next decade to ensure that we are on a pathway that allows us to meet net zero emissions in all demand scenarios'.

2.91 The Government published their 'Net Zero Strategy: Build Back Greener' (DBEIS, 2021b), which is aimed at following a path over the next three decades to avoid catastrophic climate change. The Government see the present challenge to meet Net Zero by 2050 as offering opportunity for a green industrial revolution. For power this means a fully decarbonised power system, including more solar energy.

2.92 The Net Zero Strategy also provides policies in relation to decarbonising industry, heat and buildings, transport, natural resources, waste and fluorinated gases, and greenhouse gas removals.

2.93 The top two commitments for power in the strategy are:

- *take action so that by 2035, all our electricity will come from low carbon sources, subject to security of supply, bringing forward the government's commitment to a fully decarbonised power system by 15 years; and*
- *accelerate deployment of low-cost renewable generation, such as wind and solar through the Contracts for Difference scheme by undertaking a review of the frequency of the CfD auctions.*

2.94 The Net Zero Strategy highlights that *'solar and wind power are now cheaper than new coal and gas power plants in two-thirds of the world'*. It is also acknowledged that following the path to Net Zero will provide a significant number of jobs and economic benefit for consumers and the country.

2.95 Most recent advice on achieving net zero comes from the All-Party Parliamentary Group (APPG), Net Zero Roadmap (2021). The Net Zero APPG has brought together key opinion formers and decision makers including the Climate Change Committee, parliamentarians from across the political spectrum and high-level support from industry leaders and academic experts to contribute to the Net Zero Roadmap and further influence policy to help accelerate progress and embed net zero solutions for business and consumers alike.

2.96 The report is clear that Net Zero must be at the heart of all future policy accelerated through a cultural change. During preparations of the report evidence was given, and regret expressed, about the lack of long-term climate goals being incorporated into

the 'build back better' response to the Covid-19 pandemic. The APPG stress that there are many opportunities for decarbonising the energy sector which must be taken simultaneously in order to achieve Net-Zero in time.

Energy Security

2.97 In April 2022 the UK Government published the British Energy Security (BES) Strategy in response to the global energy price rise and conflict between Russia and the Ukraine. The Prime Minister set out that *'we're going to take advantage of Britain's inexhaustible resources of wind and - yes - sunshine'* (DBEIS and Prime Ministers Office, 2022a).

2.98 Specifically regarding renewable energy there was increased ambition for building offshore wind faster: targeting 50GW by 2030. The BES Strategy also recognised that onshore wind is one of the cheapest forms of renewable power and yet there was no policy change to provide a pathway for this type of energy, still *'putting local communities in control'* of onshore wind proposals in England. For solar the BES Strategy reported that there is currently 14GW of solar capacity

in the UK and the cost has fallen so a five-fold increase in deployment is expected by 2035. It goes on to state:

'We will continue supporting the effective use of land by encouraging large scale projects to locate on previously developed, or lower value land, where possible, and ensure projects are designed to avoid, mitigate, and where necessary, compensate for the impacts of using greenfield sites.'

2.99 The BES Strategy has progressed to the Energy (Security) Bill, introduced to parliament on 6th July 2022. However the Bill is focused on growing carbon capture and storage, hydrogen and nuclear fusion technologies; reforming the energy system to protect consumers from unfair pricing; and ensuring safety, security and resilience of the UK's energy system - focused on oil and nuclear sources.

2.100 At the time of writing, the Energy Bill is at the committee stage in the House of Lords with a considerable journey before the Bill is given Royal Assent and becomes law.

Renewable Energy Planning Policies

- 2.101 The Planning Statement submitted in support of the application discusses the planning policy position in detail. However, it is important to note that policy in relation to renewable energy is derived in the context of the identified need to decarbonise the energy system.
- 2.102 The National Planning Policy Framework (NPPF) (MHCLG, 2021b) provides the current legal basis and guidance for determining planning applications. Paragraph 158 of the NPPF advises that local planning authorities should:
- 'a) not require applicants for energy development 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*
- b) approve the application if its impacts are (or can be made) acceptable⁵⁴. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should also expect subsequent applications for commercial scale projects outside these areas to demonstrate that the*

proposed location meets the criteria used in identifying suitable areas'.

(Note: Footnote 54 does not apply to solar projects and so is not considered further in this Chapter).

- 2.103 In other words, against the backdrop identified in this chapter, the need for renewable and low carbon energy is established.

THE EAST CAMBRIDGESHIRE DISTRICT COUNCIL RESPONSE

- 2.104 East Cambridgeshire District Council declared a Climate Emergency in October 2019.
- 2.105 In June 2020 the Council published an Environmental Plan, 'A Strategy And Action Plan To Boost The Environment And Help Mitigate Climate Change', which highlighted the steps put in place to help reach its goal of being a 'carbon net zero' authority.
- 2.106 This Environmental Plan was amended further for 2022/23 and includes a list of 20 commitments which set out how the Council's operations will reach net zero carbon emissions by 2040 or earlier.

- 2.107 In relation to renewable energy development the strategy states;

In seeking to reach the overall goal of 'net zero' across East Cambridgeshire, it is therefore important to not only tackle what do we emit (and try to reduce it), but also consider what renewable energy we generate (and how could we, in appropriate places, increase it). And the same principle should apply to individual businesses and organisations, local communities and right down to each individual.

EAST CAMBRIDGESHIRE LOCAL PLAN ADOPTED APRIL 2015

- 2.108 There are seven Strategic Objectives of the Local Plan. Strategic Objective 7 states;
- Reduce the environmental impact of development and vulnerability to the impacts of climate change by reducing pollution and waste, maximising water and energy efficiency, dealing with flood risk and surface water management, and promoting the use of renewable energy sources and sustainable construction methods.*
- 2.109 The Renewable Energy Development section of the Local Plan states;

Proposals for renewable energy schemes will be supported wherever possible. The wider environmental, social and economic benefits will be given significant weight in planning decisions. However when assessing proposals, consideration will also be given to potential impacts on the local environment and amenity, including key views (in particular of Ely Cathedral), important wildlife sites, protected species and residential amenity, and significant adverse effects will be avoided.

A landscape assessment will be a key part of this evaluation. Various types of technology will give rise to different impacts.

Policy ENV 6 sets out the broad criteria against which any scheme for renewable energy will be assessed. The Council will expect developments for energy generation to remediate potential adverse impacts, especially in relation to visual impact, through careful location, design and landscaping following the design principles set out in this Plan.

POLICY ENV 6: RENEWABLE ENERGY DEVELOPMENT

2.110 Policy ENV 6: under the East Cambridgeshire Local Plan states;

Proposals for renewable energy and associated infrastructure will be supported, unless their wider environmental, social and economic benefits would be outweighed by significant adverse effects that cannot be remediated and made acceptable in relation to:

- *The local environment and visual landscape impact;*
- *Impact on the character and appearance of the streetscape/buildings;*
- *Key views, in particular those of Ely Cathedral;*
- *Protected species;*
- *Residential amenity;*
- *Safeguarding areas for nearby airfields; and*
- *Heritage assets.*

Renewable energy proposals which affect sites of international, national and local nature importance or

other irreplaceable habitats will be determined against the relevant sections of Policy ENV 7.

The visual and amenity impacts of proposed structures will be assessed on their merits, both individually and cumulatively.

Provision should be made for the removal of facilities and reinstatement of the site, should they cease to operate.

2.111 There is also reference to renewable energy generation under Policy GROWTH 6 Community-led Development, which states;

The District Council is generally supportive of community-led development. This may include schemes involving affordable housing, small business units, renewable energy generation and other appropriate uses.

2.112 At present there is no Neighbourhood Plan for the parish of Bottisham and the Parish Council are seeking to put a working group together to establish one.

2.113 A complete discussion of the relevant planning policies to the Proposal, at National and Local level, is contained in the Planning Statement submitted alongside this Environmental Statement.

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CHAPTER 3 - SITE SELECTION AND DESIGN

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INTRODUCTION AND POLICY BACKGROUND

3.1 This chapter discusses the site selection process undertaken to identify the Six Oaks Renewable Energy Park location, and the evolution of the site layout throughout the EIA process. Following an outline of the background policy relevant to site selection and design, this chapter considers the specific site design criteria that are presented across the

various applicable national policies and local policies and guidance provided by East Cambridgeshire District Council (as lead determining authority).

3.2 The site design criteria considered within this chapter are derived from the combined current applicable policies, alongside standard industry practice.

National Policy and Guidance

3.3 The site design criteria considered within this chapter is formed via a combination of applicable guidance from each of the relevant policies to solar energy and infrastructure development. Guidance was taken from the NPPF, NPPG, NPS EN-1 and NPS EN-3. The main planning and environmental issues identified in planning policy for the selection of solar energy and Battery Energy Storage System (BESS) sites are discussed in the following sections.

National Planning Policy Framework (NPPF)

3.4 The National Planning Policy Framework (NPPF) (MHCLG, 2021a) requires local planning authorities to:

'help increase the use and supply of renewable and low carbon energy and heat, plans should:

a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);

b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and ...' (Paragraph 155).

3.5 The NPPF continues in Paragraph 158 to state:

'When determining planning applications for renewable and low carbon development, local planning authorities should:

a) 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

b) approve the application if its impacts are (or can be made) acceptable [reference to wind power footnote removed]. Once suitable areas for

renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas.'

National Planning Policy Guidance (NPPG)

3.6 National Planning Policy Guidance (NPPG) was published as an online resource by the Department of Communities and Local Government in March 2014. Each part of the guidance is updated as necessary. At the time of writing, the last update made was 24th June 2021 (MHCLG, 2021b), but the section for renewable and low carbon energy has not been updated since it was first published in 2015.

3.7 The National Guidance suggests that the key determining factors for identifying suitable locations for renewable energy schemes are:

- Neighbourhood Plans - *'The National Planning Policy Framework explains that all communities have a responsibility*

to help increase the use and supply of green energy, but this does not mean that the need for renewable energy automatically overrides environmental protections and the planning concerns of local communities' [Paragraph Reference ID: 5-003-20140306];

- Landscape Character - *'In considering impacts, assessments can use tools to identify where impacts are likely to be acceptable. For example, landscape character areas could form the basis for considering which technologies at which scale may be appropriate in different types of location'* [Paragraph Reference ID: 5-005-20150618]; and
- Cumulative impacts, local topography, heritage assets and local amenity [all mentioned at Paragraph Reference ID: 5-007-20140306].

3.8 However, *'Local planning authorities should not rule out otherwise acceptable renewable energy developments through inflexible rules on buffer zones or separation distances'* [Paragraph Reference ID: 5-008-20140306].

3.9 The NPPG then goes on to consider the particular requirements for specific renewable energy technologies. For large scale ground mounted solar it 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:

- *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. See also a speech by the Minister for Energy and Climate Change, the Rt Hon Gregory Barker MP, to the solar PV industry on 25 April 2013 and written ministerial statement on solar energy: protecting the local and global environment made on 25 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 (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 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;*
- *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' [Paragraph Reference ID: 5-013-20150327].

National Policy Statements (NPS)

3.10 In addition to the NPPF and NPPG, the National Policy Statements are also relevant in determining energy infrastructure projects. These documents include the Overarching National Policy Statement for Energy (EN-1) and the National Policy Statement for Renewable Energy (EN-3) (DECC, 2011a and 2011b; DBEIS, 2021).

3.11 Although there is no specific section within EN-3 for solar farms, guidance aimed at other technologies is considered applicable. The relevant topics and policy extracts to the Proposal are provided in the following paragraphs.

- Landscape and visual amenity:

'Proposals for renewable energy infrastructure should demonstrate good design in respect of landscape and visual amenity, and in the design of the project to mitigate impacts such as noise and effects on ecology' [Paragraph 2.4.2];

- Grid connection:

'The connection of the proposed onshore wind farm into the relevant

electricity network will be an important consideration for applicants... [Paragraph 2.7.8];

- Access:

'Applicants will need to consider the suitability of the access routes to the proposed site for both the construction and operation... [Paragraph 2.7.10];

- Flexibility and Micrositing:

'Flexibility in the project details should be allowed for in consent' [from Paragraph 2.7.18]; and

'Applicants are likely to need flexibility in a project consent to allow for any necessary micrositing of elements of the proposed wind farm after its consent and during its construction. This allows for unforeseen events which may arise.' [Paragraph 2.17.23].

Revised National Policy Statements (2021)

- 3.12 The Government has published a series of draft updates to the National Policy Statement documents.
- 3.13 A draft update to the National Policy Statement for Renewable Energy Infrastructure (EN-3) was published in September 2021. The consultation

on the draft document closed on 30th November 2021.

- 3.14 This has not yet been adopted as formal policy, but the comprehensive section on solar photovoltaic generation provides the latest governmental thinking with respect to solar guidance.

- 3.15 Draft EN-3 lists the following factors that it considers will influence site selection by applicants:

- Irradiance and Site Topography:

'Irradiance will be a key consideration for the applicant in identifying a potential site as the amount of electricity generated on site is directly affected by irradiance levels. Irradiance of a site will in turn be affected by surrounding topography, with an uncovered or exposed site of good elevation and favourable south-facing aspect more likely to increase year-round irradiance levels. This in turn affects the carbon emission savings and the commercial viability of the site';

- Proximity of a site to dwellings, with consideration to visual amenity and glint and glare;
- Capacity of a site:

'Site layout must be designed so as to maximise irradiance levels, and the panel array spacing should also seek to maximise the potential power output of the site.' *'The combined capacity of the installed inverters (measured in AC) should be used for the purposes of determining solar site capacity.'*;

- Grid Connection:

'The connection voltage, availability of network capacity, and the distance from the solar farm to the existing network can have a significant effect on the commercial feasibility of a development proposal. The applicant may choose a site based on nearby available grid export capacity. Locating solar farms at places with grid connection capacity enables the applicant to maximise existing grid infrastructure, minimise disruption to local community infrastructure or biodiversity and reduce overall costs. Where this is the case, consideration should be given to the cumulative impacts of siting a solar farm in proximity to other energy generating stations and infrastructure.';

- Agricultural land classification and land type:

'Where possible, ground mounted Solar PV projects should utilise

previously developed land, brownfield land, contaminated land, industrial land, or agricultural land preferably of classification 3b, 4, and 5 (avoiding the use of “Best and Most Versatile” cropland where possible). However, land type should not be a predominating factor in determining the suitability of the site location.’;

- Accessibility:

‘Applicants will need to consider the suitability of the access routes to the proposed site for both the construction and operation of the solar farm with the former likely to raise more issues. Given that potential solar farm sites are largely in rural areas, access for the delivery of solar arrays and associated infrastructure during construction can be a significant consideration for solar farm siting’.

3.16 The draft NPS also provides technical design considerations for the secretary of state, including:

- Access tracks: applications should include the full extent of the access routes for operation and maintenance;
- Layout design and appearance: consideration of the site layout

including levels of irradiance, proximity to available grid, predominance of open land, topography, previous land use and ability to mitigate environmental impacts and any flood risk;

- Public Rights of Way: developers are encouraged to design the layout and appearance of the site to ensure continued recreational use of public rights of way, and to minimise as much as possible the visual outlook from existing footpaths;
- Security and lighting: perimeter security measures such as fencing, electronic security, CCTV and lighting may be needed. Issues relating to intrusion from CCTV and light pollution in the vicinity of the site should be assessed;
- Project lifetimes: solar panel efficiency deteriorates over time and applicants may elect to replace panels during the lifetime of the site. Applicants may apply for consent for a specified period, based on the design life of the panels. Such consent, where granted, is described as temporary because there is a finite

period for which it exists, after which the project would cease to have consent and therefore must seek to extend the period of consent or be decommissioned and removed;

- Flexibility: flexibility will be needed in relation to the dimensions of the panels and their layout and spacing.

3.17 Through an iterative considered approach to site design that inherently mitigates potential impacts wherever possible, the Proposal ensures full compliance with this guidance and consequently adheres to the spirit of EN-3.

East Cambridgeshire Policy and Guidance

3.18 As lead determining authority, East Cambridgeshire District Council's Local Plan (2015), as reviewed 2020 together with the Renewable Energy (Commercial Scale) Supplementary Planning Documents (SPD) provides some guidance relevant to the site selection and design on the Six Oaks Renewable Energy Park. The Design Guide SPD (2012) provides no specific guidance for the proposed

scale of the Six Oaks Renewable Energy Park and is superseded by the Renewable Energy (Commercial Scale) (2014). The proposed area of solar array, BESS and substation compound are outside of any areas identified on the Policies Map.

Local Plan (2015, review 2020)

3.19 Most notable relevant policies for this Proposal are:

ENV 1: Landscape and settlement character;

ENV 2: Design;

ENV 6: Renewable energy development;

ENV 7: Biodiversity and geology;

ENV 10: Green Belt; and

ENV 14: Sites of archaeological interest.

3.20 As the principal guiding policy, detailed guidance has been taken from ENV 6 which states:

'Proposals for renewable energy and associated infrastructure will be supported, unless their wider environmental, social and economic benefits would be outweighed by

significant adverse effects that cannot be remediated and made acceptable in relation to:

- *The local environment and visual landscape impact.*
- *Impact on the character and appearance of the streetscape/buildings.*
- *Key views, in particular those of Ely Cathedral.*
- *Protected species.*
- *Residential amenity.*
- *Safeguarding areas for nearby airfields; and*
- *Heritage assets.*

Renewable energy proposals which affect sites of international, national and local nature importance or other irreplaceable habitats will be determined against the relevant sections of Policy ENV 7.

3.21 Policy **ENV 10** states:

Development in the Green Belt will be strictly controlled, and limited to certain exceptions as prescribed in the NPPF. Development proposals for exceptions will also need to accord with other policies in the Local Plan.

Where development is permitted within the Green Belt it must be:

- *Located and designed so that it does not have an adverse effect on the rural character and openness of the Green Belt; and*
- *Subject to landscaping conditions, together with a requirement that any planting is adequately maintained to ensure that any impact on the Green Belt is mitigated.*

Renewable Energy SPD

3.22 The SPD considers specifically the development of commercial scale renewable energy schemes of less than 50MW.

3.23 The SPD identifies the environmental, economic and social benefits of renewable energy and states in paragraph 2.4.5 that these benefits will be considered against

'whether there are any adverse impacts, for example on landscape character, the natural and historic environment, public rights of way and highway network, residential amenity and the operation of aviation sites.

3.24 The same paragraph goes on to state:

Applications will be refused where there are considered to be significant adverse impacts that outweigh the benefits of renewable energy.

- 3.25 The SPD goes on to specify the types of assessment needed to support renewable energy applications including green belt, site restoration and use of agricultural land.
- 3.26 A complete discussion of the relevant planning policies to the Proposal, at National and Local level, is contained in the **Planning Statement** submitted alongside this Environmental Statement.

Industry Guidance

- 3.27 Throughout the design of the project, the following industry guidance has been considered during the site design phase:
- Planning Guidance for the Development of Large-Scale Ground Mounted Solar PV Systems (Building Research Establishment (BRE), 2014a);
 - Agricultural Good Practice Guidance for Solar Farms (BRE, 2014b);

- BRE National Solar Centre Biodiversity Guidance for Solar Developments (BRE, 2014c);
- Natural England Technical Information Note 101: Solar Parks: Maximising Environmental Benefits (Natural England, 2011); and
- UK Solar PV Strategy Part 2 (DECC, 2014).

- 3.28 Incorporating the guidance, the design aim is to minimise the potential visual and long-term land use impacts of the renewable energy park, enhance the site in relation to its biodiversity and landscape context, whilst generation through solar PV, providing stability to the grid network through the balancing action of the BESS.

ENVIRONMENTAL CONSIDERATIONS

Designations

- 3.29 As discussed further in **Chapter 4 - Existing Conditions**, there are no national historic, ecological or

landscape designations within the site boundary.

- 3.30 Heath Road to the south of the southern boundary is a County Wildlife Site and is crossed by the access track.
- 3.31 Within 2km of the land area under consideration there are:
- four Scheduled Monuments - a Romano-British settlement west of Allington Hill (c. 165m east), three bowl barrows to the north-west of Hare Park Stud (c. 550m east-north-east), five bowl barrows to the north of Hare Park Stud (c. 595m east) and four bowl barrows at Allington Hill (c. 770m E);
 - Wilbraham Temple Registered Parks And Garden (Grade II) c. 1.4km south-west; and
 - 17 Listed Buildings, comprising 3 grade II* assets (Six Mile Bottom Windmill, c. 1.3km SE; Wilbraham Temple and its associated Outbuilding, both c. 1.7km SW).
- 3.32 There are no Areas of Outstanding Natural Beauty (AONB); National Nature Reserves; National Parks; Ramsar sites; Special Areas of

Conservation (SAC); Special Protection Areas (SPA); Sites of Special Scientific Interest (SSSI); Local Nature Reserves; World Heritage Sites; Registered Battlefields within 2km of the potential site area.

Green Belt

3.33 Whilst not a landscape designation, the site is within Cambridge Greenbelt - which extends from the A11 to the A1303 approximately 1.9km north of the site location. Green Belt is considered further within the Planning Statement accompanying this application and within the site identification discussion in **paragraph 3.79 on page 49**.

Visual Screening

3.34 The existing field boundary vegetation is an important consideration for the site design, as it has the potential to mitigate landscape and visual impacts if restored and improved. The existing field pattern that is part of the development provides the opportunity to retain and improve existing hedgerows. Substantial lengths of new hedgerows will be planted on site as part of the Outline Landscape and Biodiversity Mitigation

and Enhancement Plan (**Figure 8.3**). The site will be well enclosed by the bounding A11, A14 and hedgerow proposals.

3.35 Mitigation and enhancement elements are discussed further in **Chapter 8 - Ecology** and **Chapter 9 - Landscape and Visual Assessment** and a detailed LBMEP will be secured by way of planning condition and agreed with East Cambridgeshire District Council.

Ecology

3.36 As discussed from **3.29 on page 43** and as discussed further in **Chapter 9 - Ecology**, there are no ecological designations on the site.

3.37 The site design has ensured that only lower quality habitats would be affected. Appropriate separation distances have been applied from ecological features such as hedgerows around the site.

Flood Risk

3.38 According to the NPPG, a sequential approach should be taken when designing individual projects, such that areas of lower flood risk are utilised in preference to land at higher risk of flooding where possible.

3.39 Overarching National Policy Statement for Energy, EN-1 (DECC, 2011a), advises that all applications for energy projects of 1ha or greater located in Flood Zone 1, and all proposals in Flood Zone 2 and 3, should be accompanied by a flood risk assessment.

3.40 The Environment Agency Flood Map for Planning shows that the proposed site is within Flood Zone 1. Flood Zone 1 is defined as an area with a low probability of flooding, where the annual probability of flooding from river or sea is less than 0.1%.

Cultural Heritage

3.41 The NPPG states:

'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' [Paragraph Reference ID: 5-013-20150327].

- 3.42 There are no Scheduled Monuments, World Heritage Sites, Registered Battlefields or Registered Parks and Gardens within the site.
- 3.43 There are no listed buildings within the site area. In the wider 2km study area, listed buildings are located within the settlements of Bottisham and Great Wilbraham, with the closest being across the A14 to the north of the site. As such, any potential views will be screened by built form and intervening landscape. A detailed heritage assessment considering potential archaeological features and built assets accompanies the planning application.

TECHNICAL CONSIDERATIONS

- 3.44 The initial suitability of the landholding for a renewable energy park and the initial site design, within the boundaries of the landholding, was based on consideration of the following technical constraints and

as guided by industry best practice, the NPPF, NPPG and National Policy Statements (EN-1 and EN-3).

Electricity Network Connection

- 3.45 As the most critical and defining element to the identification of a Renewable Energy Park, grid connection at 33kV was assessed as being available at the Fulbourn substation, a connection was subsequently secured. Such a secured connection offer is a key feasibility constraint for the progression of a solar farm and BESS facility in England.
- 3.46 From the battery storage and substation compound, high voltage cables would be underground across the fields to the south of the array to Wilbraham Road, from where the route will follow the highway. Further details of the grid connection compound are provided in **Chapter 6 - Development Proposal**. Application for the connection will follow a separate consenting procedure and therefore whilst detail of this route is not currently available, this ES has considered the likely cable

route in relevant assessments at a proportionate level of detail.

Land Availability and Existing Use

- 3.47 Initially, the developer identified an area with potential grid capacity nearby. More detailed environmental constraints were applied to this initial area of interest to refine the potentially suitable host land. Interest of the relevant landowners was established and then detailed site surveys were commenced.
- 3.48 Discussions and knowledge sharing with the landowners has been instrumental in the development of the solar farm design from the initial stages, largely with respect to ensuring that plant and equipment are positioned so as to relate adequately to existing and future planned agricultural activities.

Agricultural Land Quality

- 3.49 As noted at **Paragraph 3.9 on page 38**, the NPPG asks Local Authorities to consider the quality of land upon which the renewable energy park is proposed, as well as how the land can support agricultural use in the future.

3.50 The recent draft National Policy Statement for Renewable Energy (NPS-EN3)(DBEIS, 2021) states that;

'...land type should not be a predominating factor in determining the suitability of the site location'.

3.51 Agricultural land as a site design consideration is discussed in **paragraph 3.87 on page 49**. A full consideration of current Agricultural Land Quality and also of soil quality after the life of the project was considered and is provided in **Chapter 5 - Agricultural Land**.

Temporary Structures

3.52 SPD Guidance discusses 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 same principle applies to BESS infrastructure.

3.53 This was reflected in the initial and subsequent site designs, using modular units and minimal concrete, allowing the site to be decommissioned and removed at the end of its operating life. The site would return to agricultural use with

the soils having benefited from being rested from intensive production in the intervening years.

Glint/Glare

3.54 The detailed assessment of glint and glare has been undertaken by Neo Environmental. No impacts are anticipated.

Active Solar Arrays

3.55 There may be additional impacts if solar arrays tilt to follow the daily movement of the sun. From the outset, this proposal has been for fixed panels that do not follow the movement of the sun. In this regard the impact was assumed to be consistent through the day with consideration of the sun's path through the sky.

Security

3.56 The initial design considered there would be temporary, sensor controlled, lighting during the construction phase while materials are stored on site. The construction phase was considered likely to last for up to nine months. No lighting will be erected for the operational phase.

3.57 The site was designed to be bounded by a stock proof fence with wooden posts, to minimise visual impact.

3.58 Inward-facing CCTV was considered to provide security monitoring with cameras mounted on 2m posts independent of the boundary fence. Any CCTV lighting would be infrared and so considered not visible to the naked eye.

Resource and Spacing

3.59 As recognised in the NPPG, the energy generating potential of a solar farm can vary for a number of reasons including, latitude and aspect. The Applicant used 'PV Syst Photovoltaic Software' to predict the potential annual yield of the solar farm. This software takes the parameters of the site and proposes an optimal array configuration. Shading and losses are factored into the simulation to estimate the total energy production from the proposed layout.

3.60 Shadows from buildings, trees or other structures can reduce performance of the PV system. Accordingly stand off distances have been built into the layout initially just from existing vegetation and as the design evolved, also from proposed vegetation. Each

bank of panels was aligned with the next and orientated so as to avoid shading from neighbouring panels.

- 3.61 With regards to the BESS compound, battery modules are typically spaced between 2m to 5m apart, depending upon the configuration of the support systems such as the PCS units and transformers and this format was adopted.

Road Access

- 3.62 The proposed development will be accessed from Wilbraham Road, using existing farm entrance and farm tracks. This access point and tracks already take agricultural vehicles and therefore Heavy Goods Vehicles (HGVs).
- 3.63 Existing farm tracks, field entrances and breaks in hedgerows will be used for the internal site track design to minimise potential environmental impact.
- 3.64 The first 1km of access track is within South Cambridgeshire District. The remaining development is within East Cambridgeshire.
- 3.65 Where sections of new, upgraded or widened access track are required

this will have the appearance of typical vernacular farm tracks with a crushed stone running surface grassed over in time. The running surface (4.5m wide) is laid over a stone sub-surface which itself is typically constructed upon a geotextile membrane.

- 3.66 Delivery of solar array and BESS components is a relatively straight forward process predominantly involving standard sized HGVs.
- 3.67 Public Rights of Way (PROWs) were avoided by the on-site access tracks as far as possible. Advanced notifications and safety measures such as banksmen will be deployed, when necessary, during construction crossing the restricted byway along the southern boundary of the substation and BESS compound.
- 3.68 The anticipated delivery route and construction traffic movements are discussed further in **the Transport and Access Statement** that accompanies the planning application.
- 3.69 When considering the layout of a solar farm, there is no statutory separation distance from the solar array or associated infrastructure to either public rights of way or the highway,

and appropriate separation is therefore considered on an individual basis. Further details in relation to potential effects on users of nearby highways and public rights of way are included in **Chapter 9 - Landscape and Visual Assessment**.

Location of Utilities Infrastructure

- 3.70 It was established that:
- the National Grid Pelham-Burwell Main 400kV double circuit transmission line crosses the western section of the site in a north-south direction;
 - a double UK Power Networks (UKPN) 33kV overhead line (on pylons) follows Heath Road, alongside the southern boundary of the proposed site; and
 - a local distribution 33kV overhead line (on wooden posts), owned by UKPN, west of the proposal;
 - a high pressure gas pipeline operated by Cadent Gas crosses the western section of the proposed site in a NNE/SSW direction, following a similar route to the National Grid 400kV power line; and

- a National Grid pipeline follows the same route direction 280m further in to the site to the south-west.

3.71 Utilities operators will be re-consulted prior to construction commencing to ensure that the baseline is unchanged.

THE DEVELOPER'S SITE SELECTION AND DESIGN APPROACH

3.72 The Developer has followed a detailed site selection process that considered a range of environmental and technical constraints as outlined in the preceding paragraphs. The site identification and validation process is described in more detail in the following sections.

3.73 As acknowledged by the Building Research Establishment's Planning Guidance (BRE, 2014a), the UK receives a significant amount of solar energy. At the proposed site, approximately 1 001 - 1 050kWh of solar irradiation falls on each square metre of horizontal surface, as shown at **Plate 3.1**.

3.74 The next principal technical constraint is available grid connection. Within

East Cambridgeshire district, the Developer has secured a grid connection at the Fulbourn substation.

3.75 Land within relative proximity to Cambridge, a growing city with increasing electricity demand, was screened to identify areas with enough contiguous land to have potential to host a solar farm maximising use of the connection capacity and the associated BESS facility. An arbitrary search radius was not applied, rather, a pragmatic review of proximate farmland was considered in light of environmental constraints. Considerations included:

- proximity to ecological, historic or landscape designations;
- proximity to settlements;
- access; and
- agricultural land classification.

3.76 Taking these constraints into account, well enclosed land between the A11 and A14 was identified to the east of Bottisham. As discussed further in **Chapter 4 - Existing Conditions**, the land was observed to have an association with energy infrastructure, particularly the 400kV overhead lines that cross the site and the transport

infrastructure bounding two sides of the site.

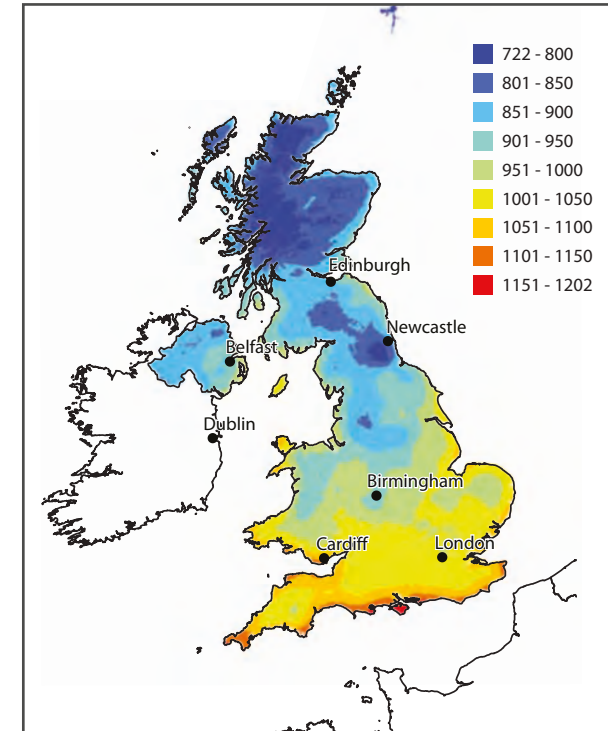
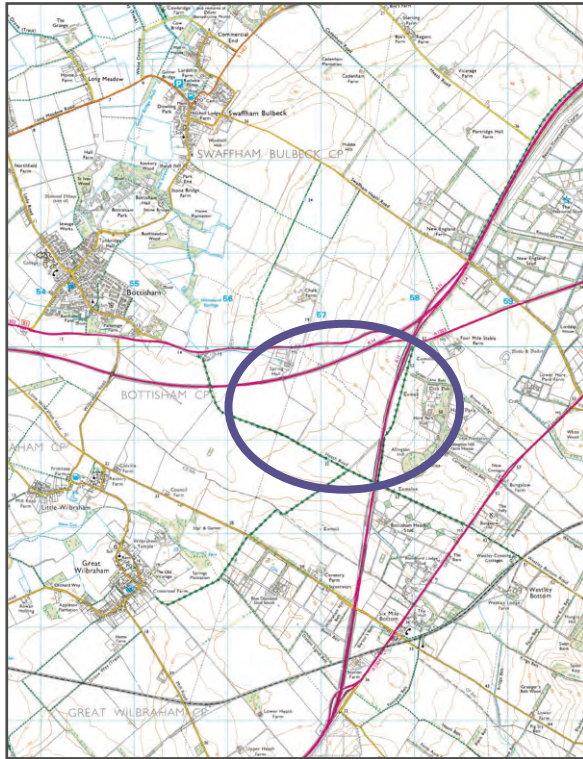


Plate 3.1 - UK Solar Irradiation Map. Yearly total of global irradiation in kWh/m². Averaging period: 1997-2003. Map data courtesy of the Met Office (BRE, 2014a)

3.77 Landowners in the area were approached and their interest was ascertained.

- 3.78 An appropriately sized portion of contiguous land between the A14 and A11 was identified as the most suitable location for the proposed solar and BESS development, due to its distance from nearby settlements and residential dwellings and proximity to the existing transport and energy infrastructure.
- 3.79 It was recognised that this parcel of land was within Cambridge Green Belt, however, it was judged that as a consequence of the Very Special Circumstances associated with the need for renewable energy and storage, the location - with the enclosed nature of the site and existing bounding infrastructure (which is judged to not consequentially change the perception of 'openness') - would not conflict with the purposes of the green belt. The Planning Statement that accompanies the planning application considers green belt in more detail.
- 3.80 The initial area of consideration included the triangular land parcel bound by the A11, A14 and Wilbraham Road (**Plate 3.2 on page 50**).
- 3.81 Following consideration of the environmental, physical and technical limitations associated with the land taken forward for initial appraisal, the area north of the restricted byway was progressed for assessment and detailed design. This evolution to the site design reduced the land-take, provided for increased separation from Wilbraham Road and accounted for the existing electrical infrastructure crossing the site.
- 3.82 At this point in the EIA and development process, the Developer undertook pre-application consultations with the local community, including parish councils. Public consultation is discussed further in **Chapter 5 - Environmental Impact Assessment** and the Statement of Community Involvement. The feedback received was constructive in refining the development design and mitigation proposals.
- 3.83 The area that was considered during the public consultation phase of the project development is shown at **Plate 3.3 on page 50**.
- 3.84 Following the Screening Opinion, EIA assessment of the proposal was progressed in respect of the potential for significant agricultural land, Ecology and Landscape and Visual impacts, which was considered a robust and proportionate approach to the assessment of environmental effects.
- 3.85 All other matters were judged to be outside of the potential for significant effects and were not included in the EIA. Assessments as identified in the SPD, i.e. Flood Risk, Glint and Glare, Heritage, Noise, Socio-economics and Traffic and Access are included as accompanying the application but outside of the ES. Green belt matters are considered within the Planning Statement.
- 3.86 A design freeze meeting took place involving the EIA assessment team. The purpose of this was to ensure all technical and environmental parameters, including public comment, were accounted for and balanced with optimising the potential generation from the site.
- 3.87 During the latter stages of the iterative EIA process, analysis of the site, its constraints and evolving technology, land to the west was removed from the solar array to avoid Grade 2 agricultural land as well as reduce potential impacts on possible archaeological asset. This iteration is shown in **Plate 3.4 on page 51**.



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Plate 3.2 - Initial A11-A14-bound land area taken forward for further appraisal (purple line)

3.88 The specific site design further evolved through the Environmental Impact Assessment process, whereby any impacts identified by the specialist assessment team



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Plate 3.3 - Site area as under consideration during public consultation phase

or consultees were mitigated for, where possible, through alterations in the site design. Concurrently, the technical assessment team were challenged to identify opportunities

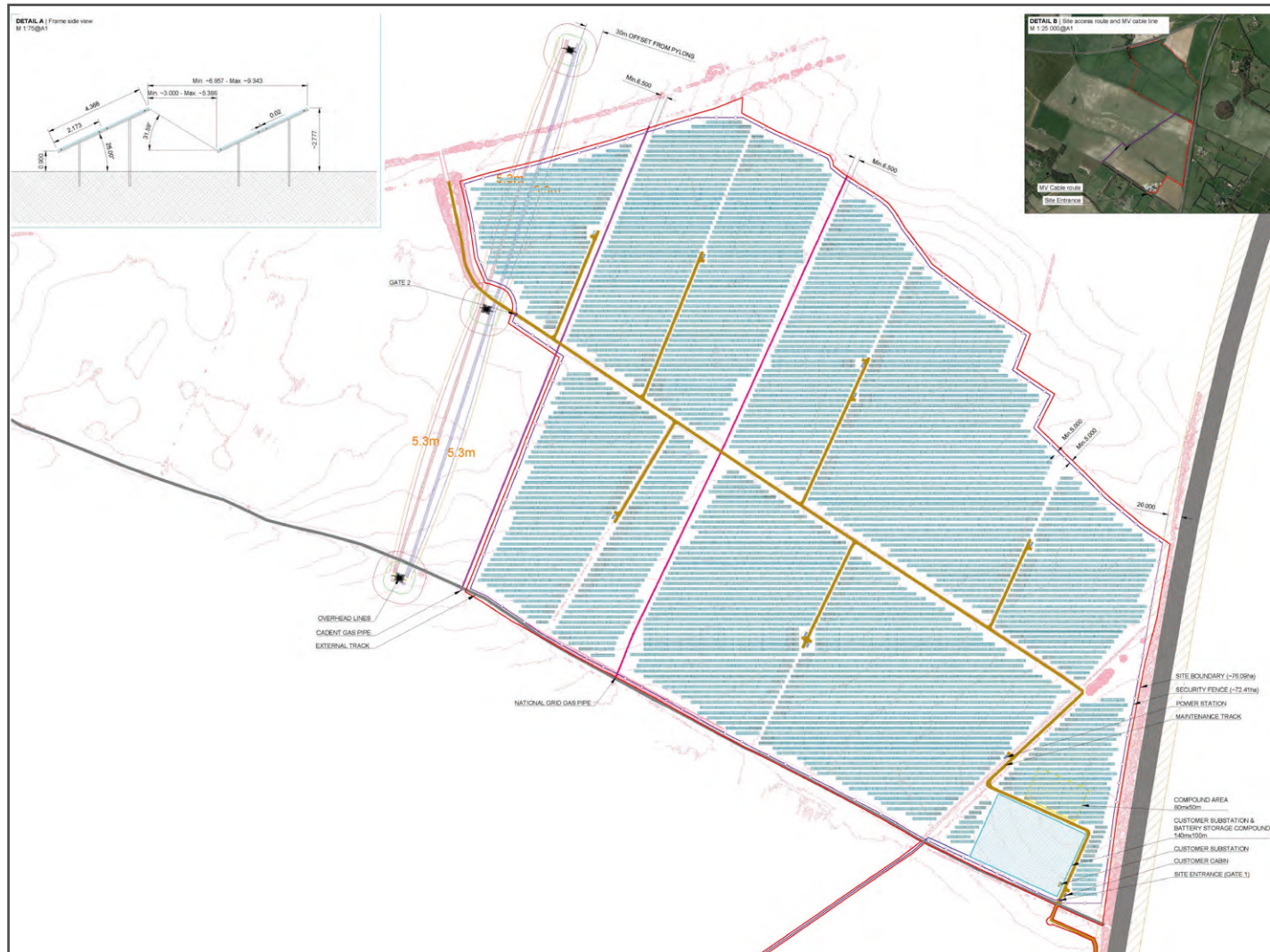
to improve and enhance the site relevant to their discipline. Measures proposed as mitigation and substantial landscape and habitat improvement include (please see **Figure 8.3 of ES Volume 3**):

- hedge planting (both new and improvement of existing hedges);
- tree planting; and
- use of wildflower seed and species rich grassland.

3.89 The resulting layout assessed as reported in this ES, and progressed for submission is shown at **Plate 3.4 on page 51**, as well as **Figure 1.2** and **Figure 1.3** of the **ES Volume 3 - Figures**.

3.90 The Six Oaks Renewable Energy Park was judged by the Developer and the EIA and non-EIA assessment team to be a location offering the prospect of a suitable balance of the site-specific features which render a solar and BESS development (with its associated environmental benefits) both technically and financially viable, and the need to keep any adverse environmental impact of such a development to an acceptable minimum.

CHAPTER 3 - SITE SELECTION AND DESIGN



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Plate 3.4 - Optimised Layout Determined through the EIA Process (extract from **Figure 1.2**)

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INTRODUCTION

4.1 This chapter sets out the existing physical environment of the development site boundary (as shown at **Figures 1.1, Figure 1.2 and Figure 1.3 of ES Volume 3**) and its setting in the wider context, together with a summary of the solar energy developments in the area.

SITE LOCATION

4.2 The total area within the development boundary totals approximately 76.4ha (188 acres), of which 72.4ha are fenced. The edge of Bottisham village is c. 1.4km west-north-west to the site boundary. Little Wilbraham is c. 1.9km to the west-south-west and Great Wilbraham is c. 1.9km to the south-west of the proposal. The site lies within East Cambridgeshire District Council with the site access crossing in to South Cambridgeshire.

4.3 The A14 and A11 trunk roads are located to the north and east of the proposal, respectively. Six Mile Bottom/Wilbraham Road is approximately 1km south of the proposed site.

4.4 The site and the majority of the access lies within Bottisham Parish Council. The first part of the access is in Little Wilbraham and Six Mile Bottom Parish in South Cambridgeshire. A map showing the location of the site is at **Plate 4.1 on page 63**.

4.5 As well as being encompassed by two major trunk roads, the site is crossed by a number of overhead power lines including circuits owned by the local

Distribution Network Operator UK Power Networks and also National Grid.

4.6 The ability to connect a generator to the power network is a significant factor of the site selection process as large parts of the network have no available capacity for new connections.

4.7 Detailed investigations for this site have confirmed that a connection can be made to the electricity distribution network and this connection has been secured.

4.8 Site visits have shown that the site is predominantly well screened from outside views, although some close views in to the development will be possible.

4.9 The closest dwellings to the proposal (within approximately 1.0km of the array boundary) and their approximate distance to the closest point of the development boundary are listed in **Table 4.1 on page 57**.

PAST AND PRESENT AND FUTURE LAND USE

Existing Land Use

4.10 The site is predominantly arable farmland comprising of large and medium sized fields across a gently undulating terrain that rises from 18m AoD at the west to 38m AoD at the east.

4.11 There are a number of infrastructure features existing in the landscape around the potential solar farm and BESS site. These include:

- the National Grid Pelham-Burwell Main 400kV double circuit transmission line crosses the western section of the site in a north-south direction;
- a double UK Power Networks (UKPN) 33kV overhead line (on pylons) follows Heath Road, alongside the southern boundary of the proposed site;
- a local distribution 33kV overhead line (on wooden posts), owned by UKPN, west of the proposal;

- the A14 trunk road runs along the northern boundary of the site;
- the A11 trunk road to the east of the proposal;
- Six Mile Bottom/ Wilbraham Road to the south of the site; and
- working farms with associated machinery.

4.12 A high pressure gas pipeline operated by Cadent Gas crosses the western section of the proposed site in a NNE/SSW direction, following a similar route to the National Grid 400kV power line and a National Grid pipeline follows the same route direction 280m further in to the site to the south-east.

4.13 Heath Road, a Byway Open to All Traffic (BOAT) and County Wildlife Site (CWS) is adjacent to the southern boundary of the proposed site.

4.14 At present, the site is regularly traversed by agricultural vehicles for the daily farming operations.

4.15 A selection of photos are provided in **Plate 4.2 on page 59** to show the typical conditions at the sites location.

4.16 Views of the site are partially screened from roads by existing field boundary

vegetation and topography. Prior to mitigation planting, views from some neighbouring properties and public rights of way will be considered within **Chapter 10 - LVIA**.

4.17 The solar array and BESS and Substation compound area is formed by three large fields, currently used for arable agriculture. This has been the case for at least 80 years with the division of the fields only reducing from four to three fields over this time.

4.18 The land will be available for future farming use at the end of the Proposal's 40 year lifetime.

4.19 **Chapter 10 - LVIA** provides a full description and appraisal of the landscape character. Panoramic visualisations accompany the LVIA as presented in **ES Volume 4, Visualisations**.

Table 4.1 - Dwellings within 1km of the proposed development boundary

Dwelling(s)	Distance from nearest row of solar panels (to nearest 5m)	Direction from nearest point on the boundary
Spring Farm	130m	north-west
Bottingsham Heath Stud	420m	south-south-east
Hare Park	600m	north-east
Allington Hill	600m	east
Allington Hill Farm	680m	east

annual probability of flooding from river or sea is less than 0.1%.

4.24 The surface water flood map identifies the majority of the site and access to be at 'very low' risk of flooding from surface water with a few, very small, localised areas of 'low risk' surface water flooding towards the north of the site.

Geology and Hydrology

4.20 The site is underlain by the following sedimentary bedrock:

- Zig Zag Chalk Formation - sedimentary bedrock formed between 100.5 and 93.9 million years ago during the Cretaceous period (British Geological Survey, 2022); and
- along the A11 boundary, Holywell Nodular Chalk Formation and New Pit Chalk Formation - sedimentary bedrock formed between 100.5

and 89.8 million years ago during the Cretaceous period.

4.21 The proposed site comprises shallow chalky loam soils (UKSO, 2021). Further discussion is contained within the flood risk and surface water assessment accompanying the planning application.

4.22 The Environment Agency Flood Map indicates that the entirety of the site lies within Flood Zone 1.

4.23 Flood Zone 1 is defined as an area with a low probability of flooding, where the

SIX OAKS RENEWABLE ENERGY PARK

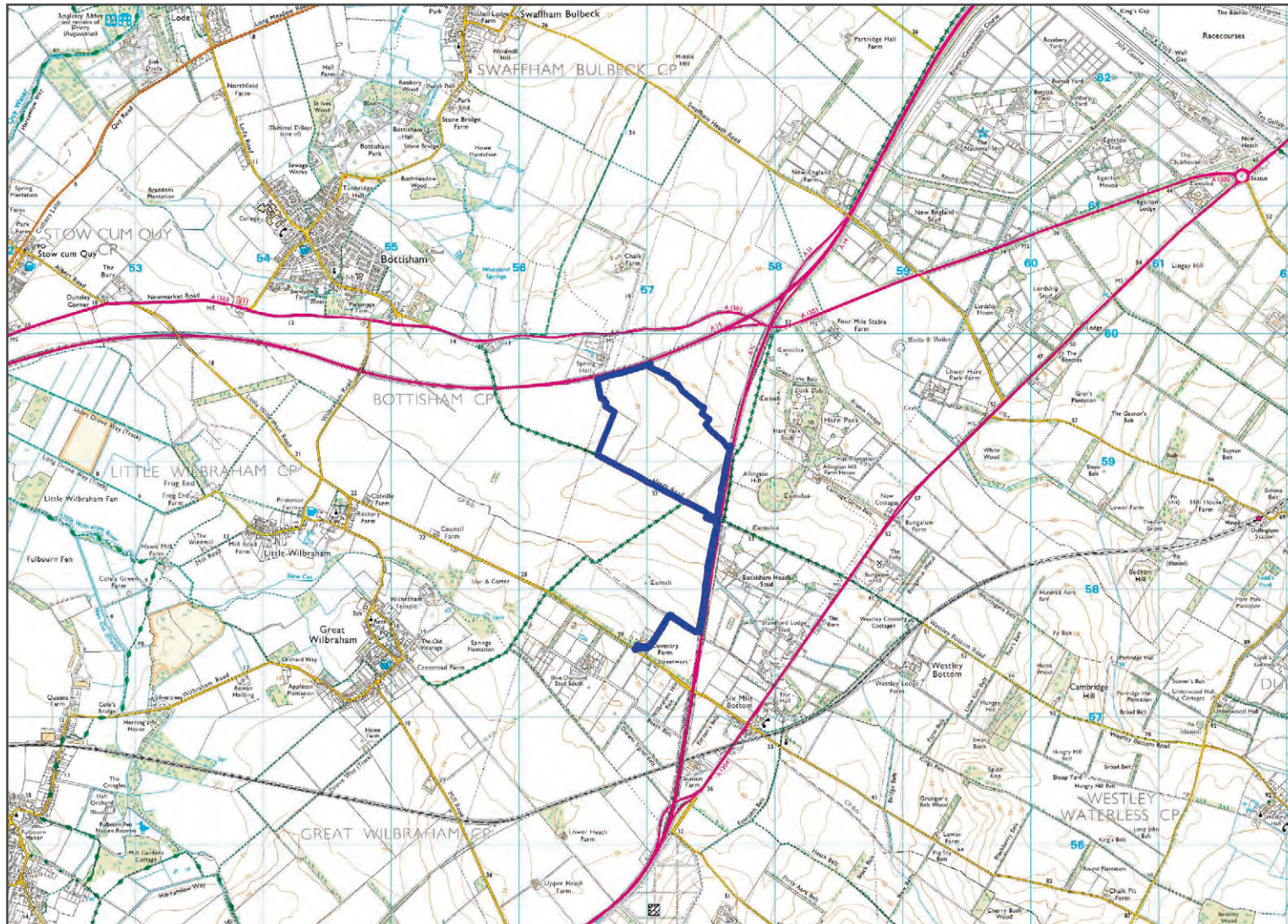


Plate 4.1 - Site Location

1:50 000 at A4. © Crown Copyright. All rights reserved, 2022. Licence number 0100031673. Site Boundary in blue.



View SW across site from NE corner (A14/A11 intersection).



View SW from Heath Road (restricted byway).



View NW along Heath Road (restricted byway) and 33kV circuit.



View N from Heath Road (restricted byway) across solar site.



Looking N across landholding (A14 in background), site behind hedge.



Wadlow Wind Farm and A11 from northern end of site.

Plate 4.2 - Photos of Existing Site Environment

Public Rights of Way

- 4.25 There are no public rights of way crossing the fenced solar array, BESS and substation compound. A restricted byway (Footpath 7) travels along Heath Road, adjacent to the southern boundary of the proposed site. It will be necessary to cross the restricted byways with the access track. Views from this PROW are screened by well established hedgerows. Footpath 8 (byway) travels southwards from Heath Road towards Six Mile Bottom/Wilbraham Road.
- 4.26 Additional PROWs, predominantly footpaths, are located in the wider area. The Harcamlow long distance route is approximately 4.4km to the west/south-west at its closest point.

DESIGNATIONS

- 4.27 As noted in **Chapter 3 - Site Selection and Design**, National and local designations were identified to shape the site selection and design process. The results of the designations search via 'MAGIC' are shown in **Plate 4.3 on page 61** and listed in full at **Appendix 4.1**.

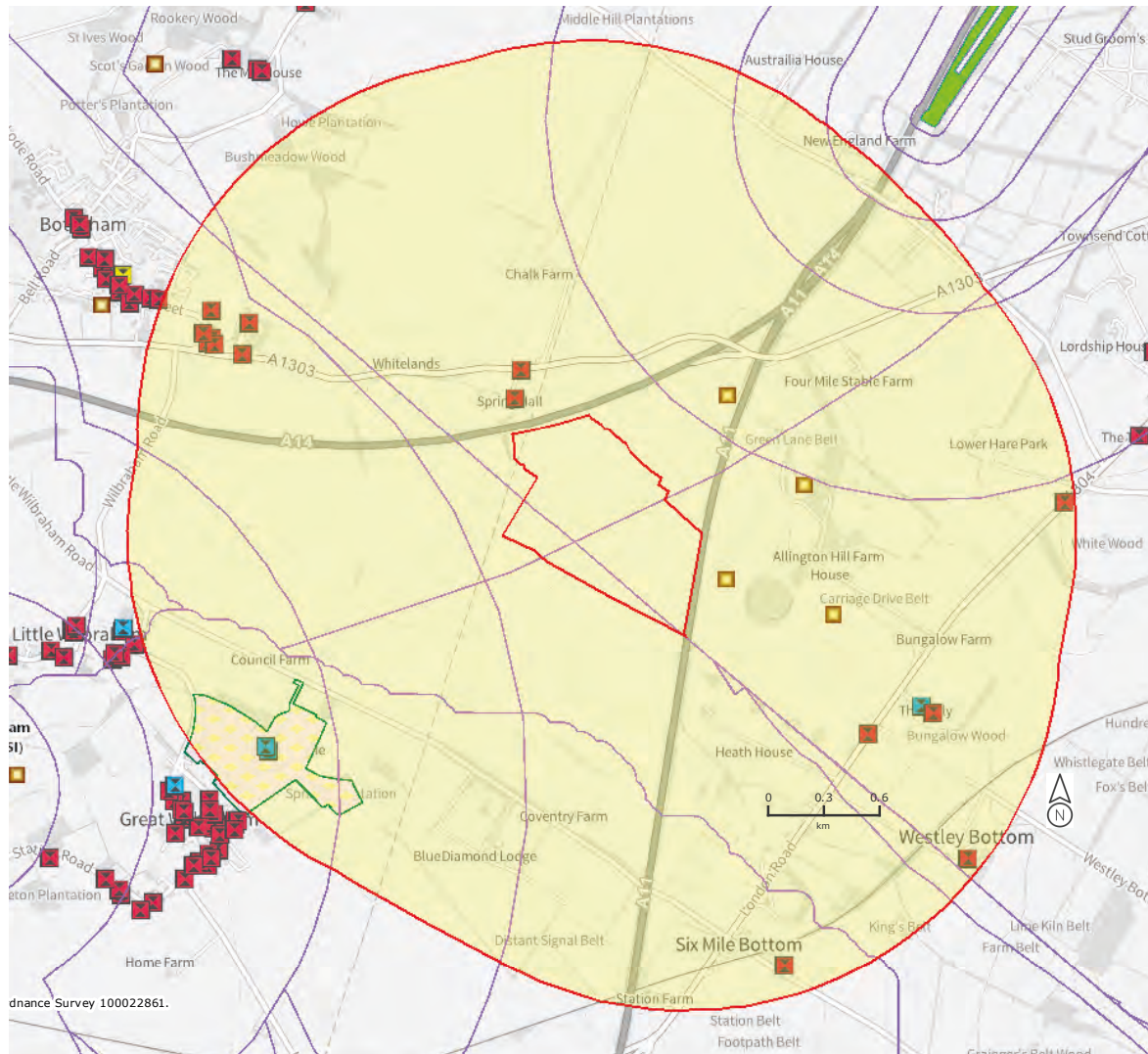
- 4.28 Within 2km of the land area under consideration there are:
- four Scheduled Monuments - a Romano-British settlement west of Allington Hill (c. 165m east), three bowl barrows to the north-west of Hare Park Stud (c. 550m east-north-east), five bowl barrows to the north of Hare Park Stud (c. 595m east) and four bowl barrows at Allington Hill (c. 770m E);
 - Wilbraham Temple Registered Parks And Garden (Grade II) c. 1.4km south-west; and
 - 17 Listed Buildings, comprising 3 grade II* assets (Six Mile Bottom Windmill, c. 1.3km SE; Wilbraham Temple and its associated Outbuilding, both c. 1.7km SW.
















- 4.29 There are no Areas of Outstanding Natural Beauty (AONB); National Nature Reserves; National Parks; Ramsar sites; Special Areas of Conservation (SAC); Special Protection Areas (SPA); Sites of Special Scientific Interest (SSSI); Local Nature Reserves; World Heritage Sites or Registered Battlefields within 2km of the potential site area.

- 4.30 The ecological, landscape and heritage designations surrounding the proposed site are discussed in greater detail within **Chapter 9 - Ecology** and **Chapter 10 - LVIA** and their accompanying Figures and Appendices as well as the technical reports accompanying the application.
- 4.31 Whilst not a statutory designation, the site is identified as located within Cambridge Greenbelt. This is discussed further within the Planning Statement accompanying the planning application.

EXISTING AND PROPOSED RENEWABLE ENERGY DEVELOPMENTS

- 4.32 Inspection of Ordnance Survey mapping, 'renewables-map' and planning records were used to establish the cumulative baseline for the proposed Six Oaks Renewable Energy Park.
- 4.33 The 'snapshot' of the cumulative solar schemes around Six Oaks Renewable Energy Park is set out below, as identified in September 2022.



-  Ancient and Semi-Natural Woodland
-  Ancient Replanted Woodland
-  Local Nature Reserves (LNR)
-  National Nature Reserves (NNR)
-  Ramsar sites
-  Sites of Special Scientific Interest (SSSI);
-  Special Areas of Conservation (SAC);
-  Special Protection Areas (SPA);
-  Areas of Outstanding Natural Beauty (AONB);
-  National Parks;
-  Scheduled Monuments;
-  Listed Buildings (Grade I, II, and II*);
-  World Heritage Sites;
-  Registered Battlefields; and
-  Registered Parks and Gardens.

Note: Search included all designations in the key, but not all types of designation are present in the study area.

Not to Scale. © Crown Copyright. All rights reserved, 2022. Licence number 0100031673.

Plate 4.3 - Designation Search via MAGIC with 2km Buffer Around Solar and BESS Infrastructure (marked by red line)

- 4.34 These sites are identified on **Figure 9.2** of **ES Volume 3 - Figures**.
- 4.35 Potential cumulative impacts of the Six Oaks Renewable Energy Park are considered in **Chapter 5 - Agricultural Land**, the ecology assessment, **Chapter 9 - Ecology** and in the Landscape and Visual Assessment at **Chapter 10 - LVIA**.

Operating Solar Energy Developments

- 4.36 Great Wilbraham Solar Farm is an operational solar farm, located approximately 2.5km south-east of the Proposed Development, near the A11 at Six Mile Bottom. The installed capacity is 38.1MW.
- 4.37 Goose Hall Farm is an operational solar farm located approximately 5km from the Proposed Development, north-west of Burwell.
- 4.38 Heath Road is an operational solar farm, located approximately 6km east of the Proposed Development, along the A14 near Newmarket.
- 4.39 Sunclose Farm solar farm is an operational solar farm located approximately 10km north west of the Proposed Development near Milton.

Consented Solar Energy Developments

- 4.40 Burwell is a consented, solar farm located approximately 4km north west of the Proposed Development, west of Burwell.
- 4.41 Bracks Farm is a consented, solar farm located north of the A1123 approximately 10km north of the Proposed Development.
- 4.42 North Angle Farm is a consented, solar farm located north of the A1123, immediately north-west of Bracks Farm.

Proposed Solar Energy Developments

- 4.43 Sunnica is a Nationally Significant Infrastructure Project application. The scheme is split across separate sites, namely Sunnica East, and Sunnica West. Sunnica West is the nearest to the Proposed Development, being located approximately 7km to the north east of the proposed Six Oaks Renewable Energy Park. This site has been submitted and the Development Consent Order process is underway.

- 4.44 EDF Renewables have also Scoped a 49.9MW solar farm between Swaffham Prior and Swaffham Bulbeck approximately 2km north.

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CHAPTER 5 - AGRICULTURAL LAND

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AGRICULTURAL LAND CLASSIFICATION

5.1 With the support of Daniel Baird Associates, the developer, Ridge Clean Energy (RCE) has prepared the following analysis of agricultural land classification.

Methodology

5.2 There is no adopted methodology or guidance relating to the appraisal of the extent of agricultural land take (regardless of its ALC Grade) by new solar development in context against national or regional areas. The Applicant has therefore adopted a transparent and repeatable methodology as reported in this section.

5.3 Firstly, the most recently published baseline data was gathered from existing Government sources reporting 2021 agricultural land provision within the regions and counties of England (DEFRA, 2022 and 2022a). A simple area comparison was then undertaken to identify the percentage of national, regional, and county agricultural land likely to be temporarily taken by the Proposed Development.

5.4 A further comparison was then undertaken to identify the percentage of regional agricultural land likely to be temporarily occupied by the cumulation of solar photovoltaic developments within the region. Data on the installed capacity of solar farms within the region were obtained from Government sources (UK.GOV,

2022). Using the assumption that approximately one MW of installed capacity would require approximately one hectare of land, the total area of regional agricultural land temporarily taken (from solar developments in operation as well as the additive area of solar developments remaining in the planning system) was calculated. The area of the Proposed Development was then added to this figure.

5.5 Subsequently, a simple area comparison was then undertaken to identify the percentage of regional agricultural land likely to be temporarily taken resulting from the cumulative impact of the Proposed Development with existing and proposed solar development in the region.

5.6 A similar exercise was then undertaken to compare the temporary use of agricultural land from existing and proposed solar development in the county, against available agricultural land provision within the county.

5.7 The previous section reports the findings of this appraisal and forms a conclusion on the impacts from the temporary use of agricultural land.

Impact of the Proposed Development

- 5.8 Temporary use of agricultural land for renewable energy production at the proposed Six Oaks Renewable Energy Park would not have a significant impact on the agricultural land resource in Cambridgeshire or the rest of England. Agricultural land will not be lost, as the development is temporary. Further, over the lifetime of the project due to a combination of wildflower meadow and species rich grassland sown below and between the panels, chosen specifically to compliment the local ecology and boost biodiversity, soil health can recover (Defra, 2009).
- 5.9 Using readily available government statistics (DEFRA, 2022 and 2022a), RCE has calculated that Six Oaks (totalling ~75ha) constitutes 0.00084% of the total farmed area in England. Across the East of England region, the development would result in a temporary use of 0.0054% of regional farmed area (the East of England region being one of the eight regions denoting the highest tier of subdivision in England used for government statistical and administrative purposes). Within Cambridgeshire, the proposed development equates to 0.031% of total county farmland.
- 5.10 To calculate the cumulative effect of solar farms in the region, including this proposed development, the assumption that 1MW of solar farm equates to roughly 1ha of land has been employed. Considering solar farms currently in operation across the East of England region, cumulatively they result in a use of 0.17% of total regional farmland. Considering all the solar farms in operation, and in the planning system (excluding any proposals no longer being progressed or refused planning consent, but including Six Oaks), the total farmland used would equate to only 0.26% of regional farmland. Looking at Cambridgeshire, the current projects combined with proposed development in the planning system (including Six Oaks) would result in the temporary use of 0.47% of farmland against the current county farmland provision. Please see **Appendix 5.1** showing inputs and outputs of calculations for these percentage calculations.
- 5.11 For comparison, the government's Landscape Recovery Scheme aims to have 300 000ha of agricultural land used for rewilding purposes by 2042. This constitutes 3.3% of national farmland. Unlike solar farm planning consent, the duration of rewilding is not limited.
- 5.12 The land at, and surrounding, the proposed development has previously been independently assessed for its agricultural quality and versatility by the former Ministry for Agriculture, Fisheries and Food. The results of this assessment work are available on the Natural England mapping service MAGIC.gov.uk (DEFRA 2022b). Observing the results of this report, RCE altered the site design so no Agricultural Land Classification (ALC) Grade 2 land would be developed on, also ensuring that the grade 2 land is still accessible and sizeable enough to be farmed (see **Plate 5.1 on page 70** and **Plate 5.2 on page 71**). The Six Oaks Renewable Energy Park would be located on grade 3 land, 15% grade 3a and 85% grade 3b. According to the government's website, grade 3b means the land is only capable of producing moderate yields of a narrow range of crops such as grass and cereals. The temporary impact the Six Oaks Renewable Energy Park will

have on Best and Most Versatile (BMV) agricultural land (ALC grades 1, 2 and 3a) is very limited.

- 5.13 The UK Government Food Security Report, published in December 2021, is explicit:

“The biggest medium to long term risk to the UK’s domestic production comes from climate change and other environmental pressures like soil degradation, water quality and biodiversity.”

- 5.14 The report quantifies this risk, noting that under a medium emissions scenario, climate change could reduce the proportion of ‘Best and Most Versatile’ agricultural land from a baseline of 38.1% to 11.4% by 2050. This would mean a reduction in the UK’s prime agricultural land of almost three quarters.

- 5.15 The Six Oaks Renewable Energy Park will have a lifetime of 40 years. During this time the land will benefit from an extended fallow period. This break from arable production, with its attendant cultivation and application of agrichemicals, will enable a recovery of soil health. This is explained in greater detail in the Defra R&D project SP080161. For the stated reasons the

proposed Six Oaks Renewable Energy Park would not have a significant impact on agricultural production in Cambridgeshire or the rest of England.

- 5.20 Utilising 0.26% of regional farmland, equivalent to 0.47% of farmland within the county, would not have a significant effect on agricultural land use.

Cumulative Effects

- 5.16 Considering all the solar farms in operation, in the planning system (excluding any proposals no longer being progressed or refused planning consent) and including the Six Oaks Renewable Energy Park, the total farmland used would equate to 0.26% of East of England regional farmland.

- 5.17 The increase from 0.2538% without the proposed development to 0.2592% with the proposed development would not be significant.

- 5.18 Within Cambridgeshire, the current projects combined with the proposed development in the planning system (including Six Oaks) would result in the temporary use of 0.47% of farmland against the current county farmland provision.

- 5.19 The increase from 0.4396% without the proposed development to 0.4706% with the proposed development would not be significant.

SIX OAKS RENEWABLE ENERGY PARK

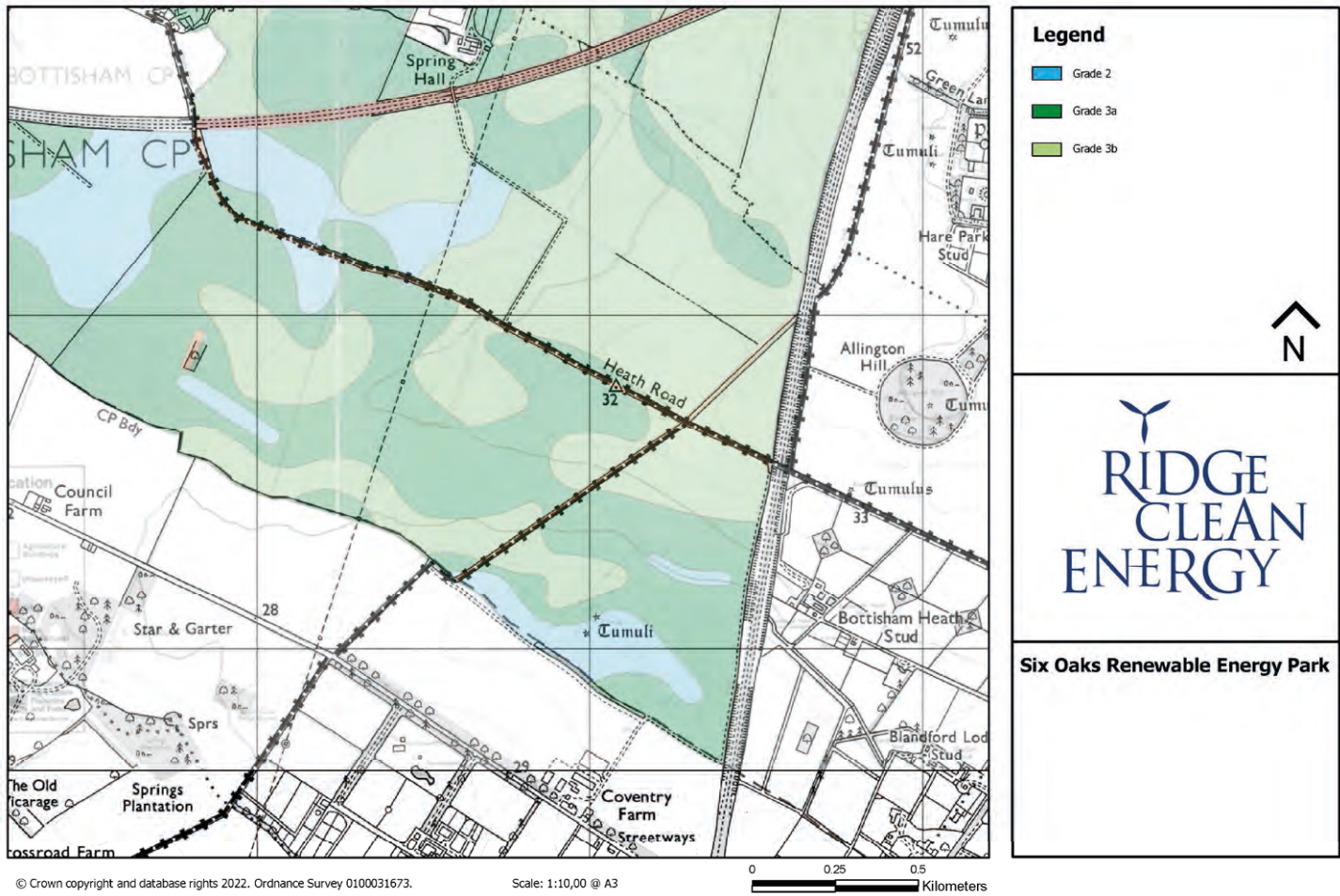


Plate 5.1 - ALC Across the area around the site

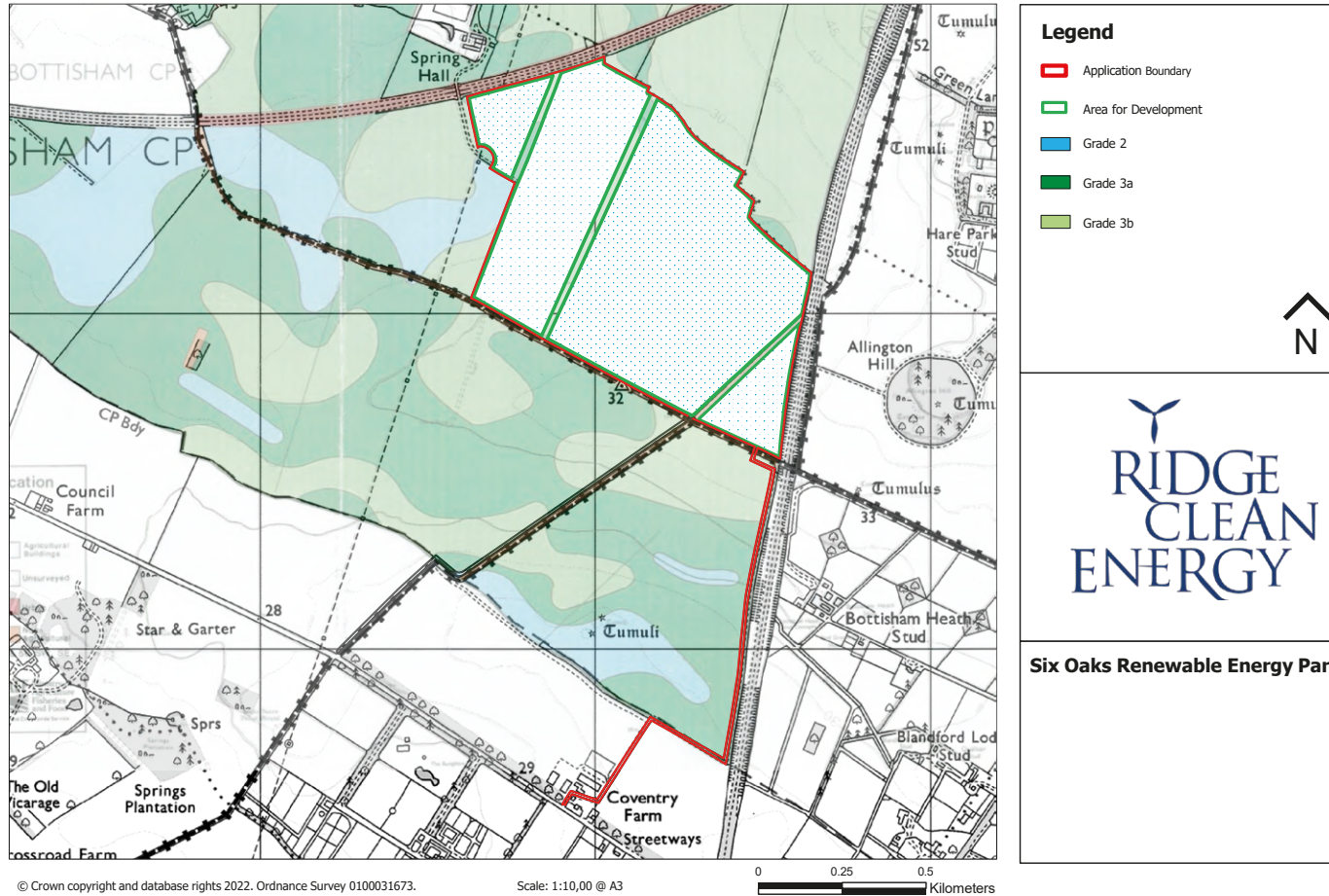


Plate 5.2 - ALC Across the area around the site and the development site boundary

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CHAPTER 6 - ENVIRONMENTAL IMPACT ASSESSMENT

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THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The Need for Environmental Impact Assessment - EIA Screening

6.1 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) require that certain types of development

must be subject to environmental impact assessment (EIA). The types of development listed in Schedule 1 of the regulations must be subject to EIA, whilst those in Schedule 2 will only require this if they are likely to give rise to significant environmental effects. If an Environmental Statement (ES) is not volunteered, then a local planning authority should screen the proposal to consider whether EIA is required. The appropriate scope of an ES can be determined through the Scoping exercise (although this is not mandatory).

6.2 Under these regulations the proposed Six Oaks Renewable Energy Park is not classed as 'Schedule 1' development, for which all proposals will require an EIA. As such, a criteria based approach is used to determine if 'Schedule 2' development requires EIA.

6.3 At Schedule 2, Part 3 (a), the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended), defines what is classified as Schedule 2 development in relation to the proposed form of development.

Column 1 - Description of development:
'(a) Industrial installations for the

production of electricity, steam and hot water (unless included in Schedule 1);'

Column 2 - Applicable thresholds and criteria: *'The area of the development exceeds 0.5 hectare.'*

6.4 A Screening Request was submitted to East Cambridgeshire District Council in January 2022. The report provided details of the proposed development and presented the screening process to be followed in line with the EIA Regulations. In addition, the Screening Request detailed the scope of works anticipated for the project and the guidance to be followed for each discipline.

6.5 A Screening Opinion was received in May 2022 and stated;

It is considered that with the significant amount of energy farm developments having taken and potentially taking place in the locality there will be a cumulative significant impact upon the visual character of the area and the amount of high quality farmland being used.

6.6 The Screening Opinion concluded that:

An Environmental Statement is required for: The cumulative impact on the

rural character of the district and the substantial loss of arable farmland in the next 30-40 years in the district.

- 6.7 Consequently, the Developer elected to undertake an EIA with the scope limited to use of agricultural land, landscape and ecology as the only disciplines with the potential for significant impacts.
- 6.8 Other assessments would accompany the application (namely heritage and archaeology, flood risk, noise, transport and access, socio-economics and glint and glare), but sit outside of the EIA.
- 6.9 This ES has been prepared by a team of professional environmental assessors (see from **Paragraph 6.36 on page 80** for further details), following an Environmental Impact Assessment (EIA) carried out under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended).

Scoping the Environmental Impact Assessment

- 6.10 Given the elective Scope of the EIA was agreed with East Cambridgeshire District Council on 10th June 2022, formal Scoping is not mandatory,

and no formal Scoping Opinion was sought to minimise workload on the authority.

- 6.11 The environmental assessments have been undertaken following well-established guidance in order to meet the requirements of Schedule 4 of the Town and Country Planning EIA Regulations 2017 (as amended) and the appropriate Development Plan policies.

Public Consultation

- 6.12 The following paragraphs are a brief summary of the public consultations that have taken place. The full report, including public feedback and copies of consultation material, is provided within the Statement of Community Involvement accompanying the application.
- 6.13 Ridge Clean Energy Limited (the Developer) on behalf of Six Oaks Renewable Energy Park Limited (the Applicant) has carried out a full programme of community consultation in support of its proposals for Six Oaks Renewable Energy Park in line with East Cambridgeshire District Council's Statement of Community

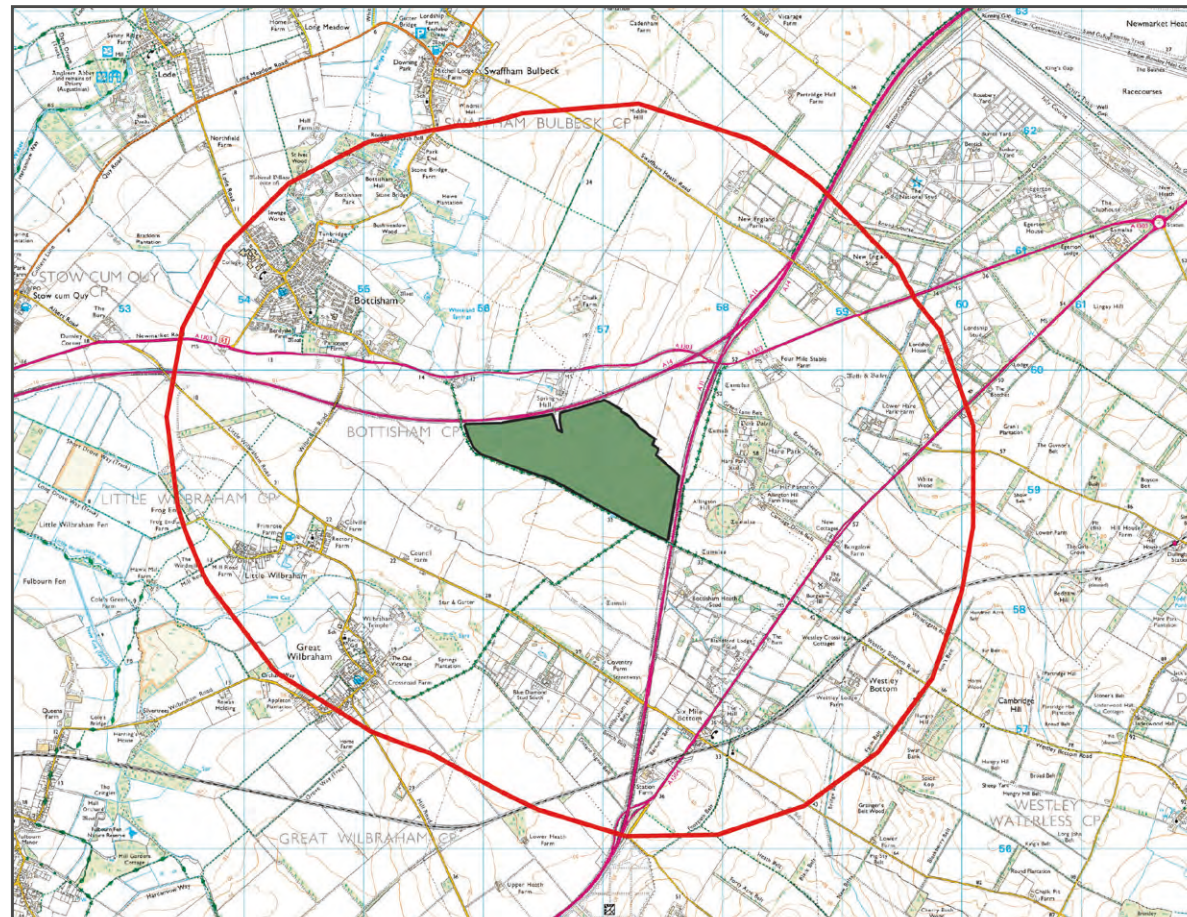
Involvement (2018). This section explains the public consultation that has been carried out in relation to this application.

Liaison with Parish Councils and Local MP

- 6.14 On 19th January 2022 the project introduction letter was sent to Bottisham Parish Council, Great Wilbraham Parish Council, Little Wilbraham & Six Mile Bottom Parish Council and to Bottisham Ward Councillors. The letter advised that the Applicant was in the early stages of investigating the potential for a renewable energy park and gave indicative scheme details (area, capacity and output), an overview of the Applicant and their intentions for working with the community and were offered the opportunity to meet the Applicant and be introduced to the proposal. On 7th March, the Applicant met with Bottisham Parish Council to introduce the proposed development.
- 6.15 On 24th January, the Applicant also wrote to the local MP for South East Cambridgeshire, to introduce themselves and the proposed development.

Public Exhibitions

- 6.16 In March 2022, a newsletter inviting the local community to the Applicant's public exhibitions was issued to residential dwellings within 2.5km of the site, amounting to over 1,500 properties. The consultation zone is identified in **Plate 6.1** below.
- 6.17 Copies of the newsletter were also sent to Bottisham Parish Council, Great Wilbraham Parish Council, Little Wilbraham & Six Mile Bottom Parish Council, the Bottisham Ward Councillors and the Fen Ditton & Fulbourn Ward Councillors. The newsletter was also sent to the MP for South East Cambridgeshire.
- 6.18 At the same time as issuing the invitations to the public exhibitions, a dedicated project website was launched at www.ridgecleanenergy.com/sixoaks/ containing information on the project, the Applicant and contact details for the Applicant's project team.
- 6.19 The Applicant hosted two public exhibitions. The first on the 28th March 2022 at Wilbrahams' Memorial Hall and the second on 29th March at the Bottisham Community Sports and Social Club. The objectives of the Public Exhibitions were:



Consultation addresses



Site Location

Plate 6.1 - Public Consultation Zone

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- Present details of the Proposed Development that were known at the time to the local community;
- Learn from the local community and encourage feedback; and to seek to make enduring relationships with groups or individuals to enhance community life.
- Engage with the community to identify uses for the proposed community benefit fund and to identify local community initiatives that the Applicant could assist with.

6.20 Large display boards were set up at the exhibitions providing information relating to:

- An overview of the Applicant;
- Indicative scheme details, including key facts and indicative timeline;
- An OS map showing distances from the Indicative Application Boundary;
- Proposed Site Design;
- Infrastructure;
- Information about the proposed technology;

- Acoustic, Heritage and Construction;
- Site Design, Biodiversity and Land Use;
- Proposed Environmental Benefits;
- Visualisations;
- Community Engagement; and
- Policy and Targets.

Feedback and Applicant's Response

6.21 Over the two public exhibition events held in the villages of Great Wilbraham and Bottisham, at least 80 people were in attendance. Ridge Clean Energy requested all attendees to complete a feedback form upon entering the venue. Respondents had an opportunity to complete the form during the event or after the event through paid-postage envelopes. Sixteen feedback forms were collected following the public exhibitions. In response to the question, 'Do you support renewable energy development', 100 percent, indicated support answering 'Yes'.

6.22 A summary of all received comments is included within the **Statement of Community Involvement**, accompanying the planning application.

APPROACH TO ENVIRONMENTAL IMPACT ASSESSMENT

Purpose

6.23 The purpose of EIA and requirement for reporting in an ES is summarised by the Ministry of Housing, Communities and Local Government National Planning Practice Guidance (MHCLG, 2020):

'The aim of Environmental Impact Assessment is to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process.' Paragraph Reference ID: 4-002-20140306.

'The Environmental Statement must contain the information specified in regulation 18(3) and must meet the requirements of regulation 18(4). It must also include any additional information specified in Schedule 4 to the 2017 Regulations 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.' Paragraph Reference ID: 4-035-20170728.

6.24 With this in mind, and having regard to requirements of Schedule 4 of the EIA Regulations, the Environmental Statement focuses upon those effects which are likely to be significant. The Environmental Statement aims to:

- obtain baseline information for the study area to identify those features that may be impacted upon by the development;
- identify and assess likely significant effects;
- identify those features of the development where environmental impacts can be avoided, and environmental benefits achieved, through careful consideration of design, construction,

operational and decommissioning methodologies and through mitigation inherent within the site design; and

- with mitigation measures in place, assess the residual impacts of the Proposal.

Scope of the EIA

Issues Not Considered Further in EIA

6.25 The NPPF (MHCLG, 2021) and NPPG (MHCLG, 2020) are material planning considerations in the determination of planning applications with NPS EN-1 (DECC, 2011a) and EN-3 (DECC, 2011b) providing valuable guidance. These policy and guidance documents help direct the scope of work for Environmental Impact Assessment for renewable energy planning applications. Engena advised East Cambridgeshire District Council of the intended Scope (Landscape and Ecology) in June 2022.

6.26 Other issues may not require further examination in the Environmental Impact Assessments for individual proposals but still require assessment

to provide the information required to determine the application.

6.27 As such, additional assessments and reports accompany the planning application but do not form a part of this Environmental Statement, these include (as supplied by):

- Flood Risk and Surface Water (RAB Consultants);
- Glint and Glare (NEO Environmental);
- Heritage and Archaeology (Orion Heritage);
- Noise (Ion Acoustics);
- Socio-economics (Engena); and
- Traffic and Access (Engena).

6.28 Other matters are explained in the following paragraphs, but are not necessary to be considered any further within the Six Oaks Renewable Energy Park Environmental Impact Assessment or this Environmental Statement (ES).

CONSIDERATION OF ALTERNATIVES

6.29 The National Planning Policy Framework (MHCLG, 2021) at Paragraph 158 describes how it is not

necessary for applicants of renewable or low carbon energy to demonstrate the overall need for such projects. The site selection and evolution process is detailed at **Chapter 3 - Site Selection and Design** but there is no further consideration of ranking of potential alternative sites or any form of sequential testing, as this is not appropriate nor in accordance with Government Planning Policy and Guidance for the proposed form of development.

6.30 Renewable energy projects such as the proposed project have a valuable role to play in offsetting emissions contributing to climate change. The 'do nothing' scenario is therefore considered in the round within **Chapter 2 - Development Rationale** with respect to climate change. The benefits of renewable energy parks are not just in abating climate change, but in producing domestic energy that is competitive in pricing with fossil fuels. Also with the proposed development there are substantial landscape and biodiversity enhancements (as detailed in the outline Landscape and Biodiversity Mitigation and Enhancement Plan, **Figure 9.3**).

6.31 Consideration of alternatives is therefore not considered further within individual chapters.

CONTAMINATED LAND

6.32 Desktop research identified that past and present land uses do not offer potential for contamination to be present on site. Therefore further investigation with respect to contaminated land is not considered necessary at the proposed site, and the matter is not discussed further in the chapters of this ES.

ACCIDENTS AND DISASTERS

6.33 Schedule 4 (8) of the EIA Regulations require:

A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks or major accidents and/or disasters which are relevant to the project concerned.

6.34 The construction process does not require any unusual or hazardous substances (other than found on standard construction sites). Furthermore, it is considered that

there are sufficient and standard construction control measures in place, which will be addressed in a CEMP, secured by way of planning condition. During operation, the solar panels are relatively inert with no moving parts and are regularly monitored. The BESS units are self-regulated (as discussed further in **Chapter 7 - Development Proposal**). Accordingly, it is considered that the Proposed Development would not be vulnerable to accidents that would result in likely significant adverse effects to the environment.

6.35 The project is not considered to be vulnerable to disasters with the exception of flood events, which are addressed in section 3 of the accompanying Flood Risk Assessment. Accordingly, it is considered that the Proposed Development would not be vulnerable to disasters that would result in likely significant adverse effects to the environment.

Environmental Impact Assessment Team

6.36 The Applicant appointed a specialist team to undertake the Environmental

- Impact Assessment and to produce the subsequent Environmental Statement.
- 6.37 The principal project manager for the Environmental Impact Assessment is Engena. Engena is an independent renewable energy planning consultancy with 16-years and over a thousand Megawatts of development experience in the UK energy industry.
- 6.38 The company specialises in the design and development of renewable energy projects and provides support and management of all associated aspects, from site feasibility assessment through to layout design and the co-ordination of environmental impact assessments and planning applications.
- 6.39 For specific activities, such as landscape and visual and ecology assessments, Engena employs independent established specialists with an expert knowledge of the appropriate standards and methodologies required for Environmental Impact Assessment (EIA) and an understanding of the potential impacts associated with renewable energy park developments.
- 6.40 The independent specialists, each established in their field, who form the Environmental Impact Assessment team with Engena are:
- Ecology Consulting - Ecology and Ornithology; and
 - Anne Priscott Associates - LVIA.
- 6.41 The specialist assessments and their associated chapters have been authored in their entirety by the relevant consultants.
- 6.42 In addition, Ridge Clean Energy with Daniel Baird Associates provided **Chapter 5 - Agricultural Land**. MS Environmental prepared the visualisations presented in Volume 4 - Visualisations.
- 6.43 The Applicant is also able to demonstrate their credentials with the project manager being a full IEMA registered EIA Practitioner as well as being a Chartered Environmentalist (CEnv). The accompanying Planning Statement has been prepared by RTPi Chartered Planners of ELG Planning.
- 6.44 The relevant qualifications and experience, demonstrating the competency of the development team is provided in the respective Chapters..

Structure of Environmental Statement

- 6.45 The findings of the Environmental Impact Assessment are presented within this four-volume, five part, Environmental Statement consisting of:
- Volume 1: Non-Technical Summary – Summarising the proposal and key significant issues and findings, in a format which is easily accessible to a non-technical audience;
 - Volume 2A: Written Statement - The detailed Environmental Statement, containing the independent specialist assessments, proposed mitigation and predicted residual impacts;
 - Volume 2B: Appendices - Containing the background research, surveys and assessments to the Written Statement;
 - Volume 3: Figures - An A3 format document containing the site layout figures, construction figures and figures accompanying the chapter specific assessments; and

- Volume 4: Visualisations - A large format document presenting the visualisations referred to in the Landscape and Visual Impact Assessment within the Written Statement.

6.46 In addition to the four-volume, five part, Environmental Statement the Applicant has also submitted a Design and Access Statement and Planning Statement.

6.47 Whilst not forming part of the Environmental Statement, the Planning Statement is a key document within the overall submission summarising the National, County and Local policy context relevant to the development, including the identified need for solar energy. The document analyses the proposed development against these policies and the need to determine the acceptability of the development at this location.

6.48 Electronic copies of the Environmental Statement have been submitted to East Cambridgeshire District Council as well as South Cambridgeshire District Council, where the document will be available for public viewing. A printed copy is available for viewing at:

East Cambridgeshire District Council,
The Grange,
Nutholt Lane,
Ely,
CB7 4EE.

6.49 Electronic copies of the Environmental Statement are also available from the project website: <https://ridgecleanenergy.com/sixoaks>.

Methodologies and Guidance

6.50 The Environmental Impact Assessment has been undertaken according to the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended), and the ES produced to report on the findings of the EIA, following the identified scope.

6.51 Throughout, general guidance has also been used from the following documents:

- National Planning Policy Framework, MHCLG, 2021;
- National Planning Practice Guidance, MHCLG, 2020;

- Overarching National Policy Statement for Energy (EN-1), 2011a;
- National Policy Statement for Renewable Energy Infrastructure (EN-3), 2011b; and
- East Cambridgeshire Local Plan 2015.

6.52 Individual specialist sections of the assessment and subsequent chapters have been prepared according to the relevant standards and methodologies pertinent to each section. Standards and methodologies referenced are detailed by topic below and discussed in each chapter. Further references may be available in individual chapters to research papers and site specific resources, where appropriate.

Specific Standards, Guidance and Methods

CHAPTER 3 - SITE SELECTION

- Building Research Establishment (BRE) Planning guidance for the development of large scale ground mounted solar PV systems (2014);

- BRE Agricultural Good Practice Guidance for Solar Farms (2014);
- BRE National Solar Centre Biodiversity Guidance for Solar Developments (2014);
- Department of Energy and Climate Change UK Solar PV Strategy Part 2 (2014);
- Natural England Technical Information Note TIN101 - Solar parks: maximising environmental benefits (2011); and
- Natural England Technical Information Note TIN049 Edition 2 - Agricultural Land Classification: Protecting the best and most versatile agricultural land (2012).

CHAPTER 5 - AGRICULTURAL LAND

- Ministry of Agriculture Fisheries and Food, Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land (1988); and
- Natural England Technical Information Note TIN049 Edition 2 - Agricultural Land Classification:

Protecting the best and most versatile agricultural land (2012).

CHAPTER 9 - ECOLOGY

- The National Planning Policy Framework (Ministry of Housing, Communities and Local Government, updated July 2021);
- ‘Managing Natura 2000 Sites’ (European Communities 2000), which gives guidance on the implementation of the Birds and Habitats Directives;
- Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater and Coastal (CIEEM 2021);
- Assessing connectivity with Special Protection Areas (SPAs) (SNH 2016);
- Birds of Conservation Concern (BoCC) 5: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man (Stanbury et al. 2021); and
- The UK Post-2010 Biodiversity Framework.

CHAPTER 10 - LANDSCAPE AND VISUAL IMPACT ASSESSMENT

- Guidelines for Landscape and Visual Impact Assessment; 3rd Edition; The Institute of Environmental Management and Assessment and the Landscape Institute (2013);
- Natural England Landscape Character Profiles;
- Natural England, An Approach to Landscape Character Assessment (2014); and
- Visual Representation of Development Proposals (LI Advice Note 06/19).

6.53 The process employed throughout the assessments has been developed to ensure a rigorous assessment and is outlined below:

- establishment of methodologies – in accordance with the relevant standards and published guidance detailed from **Paragraph 6.50 on page 82** and the relevant Planning Policies;
- identification of baseline conditions both of the site and

the surrounding study area where appropriate. This includes for the sensitivity of the receptors which may be affected through changes in baseline conditions;

- assessment of predicted impacts and their significance;
- identification of mitigation measures where appropriate; and
- identification and assessment of residual impacts following implementation of mitigation measures.

6.54 The Environmental Statement as a whole follows the same format for the technical assessments (**Chapter 9 - Ecology** and **Chapter 10 - LVIA**) with a summary of mitigation measures and residual impacts at the end of the document.

Study Area

6.55 As stated at **Paragraph 6.23 on page 78**, the Environmental Statement should focus upon potential significant effects to the baseline environment. With this in mind the study area was selected in order to allow studies to focus on significant effects.

6.56 Whilst each discipline will require a bespoke study area, the principal assessment which informs the establishment of the study area is the Landscape and Visual Impact Assessment (**Chapter 1010**).

6.57 Based on ZTV intervisibility mapping, fieldwork observations and viewpoint appraisal, it was the professional opinion of the landscape architect, that a 5km radius study area would ensure adequate assessment of significant landscape and visual effects.

6.58 The Ecological assessment (**Chapter 99**) considers the potential impacts upon ecological receptors and designations across and proximate to the site. Designated sites and species of conservation concern at a national, regional and local level have been reviewed through data search as discussed at **Chapter 4 - Existing Conditions**. The desk study to support this assessment covered all European protected sites (designated and proposed) within 20km of the Proposal, all nationally important sites within 5km and all other protected nature conservation sites within 2km.

6.59 The assessment states:

“field survey areas were chosen to include all areas within the potential zone of ecological influence of the development, where there was habitat that could support important populations, plus an area around that to provide wider context to inform the assessment. The extended Phase 1 habitat survey, breeding bird surveys and protected species surveys covered the proposed development plus up to a 500m buffer (where access/viewing was possible), whilst the wintering bird surveys extended up to a 1km buffer.”

DIFFICULTIES AND LIMITATIONS

6.60 No specific difficulties or limitations have been reported in either the ecological assessment (Chapter 9) or the LVIA (Chapter 10). As such, it is concluded a robust and comprehensive EIA has been undertaken as reported in this ES, providing East Cambridgeshire District Council with the information required to determine the application.

REFERENCES

Act of Parliament, 2017 (as amended), Town and Country Planning (Environmental Impact Assessment) Regulations: Statutory Instrument 2017 no. 571, HMSO, UK.

Ministry of Communities, Housing and Local Government, 2021, National Planning Policy Framework, HMSO, UK.

Ministry of Housing, Communities and Local Government, 2020, Planning Practice Guidance, HMSO, UK, Online Resource, retrieved from: <https://www.gov.uk/guidance/environmental-impact-assessment> [Accessed 07/12/2021].

Department of Energy and Climate Change, 2011a, Overarching National Policy Statement for Energy (EN-1), HMSO, UK.

Department of Energy and Climate Change, 2011b, National Policy Statement for Renewable Energy Infrastructure (EN-3), HMSO, UK.

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CHAPTER 7 - DEVELOPMENT PROPOSAL

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ELEMENTS OF THE SIX OAKS RENEWABLE ENERGY PARK

7.1 The elements of the Six Oaks Renewable Energy Park are described in this chapter. Where these elements may have potential impacts on the environment, reference is made to the Environmental Statement (ES) chapter where the impacts are discussed and assessed or to the technical report accompanying the application. The Transport Statement accompanying the application describes construction, operation

and decommissioning impacts on the highway network and users.

7.2 The Proposal comprises a solar array and Battery Energy Storage System (BESS) with the necessary electrical and supporting infrastructure to export and generate electricity to the grid and charge the battery. In addition to the technical equipment, a range of environmental enhancements are included with the application. These measures are discussed further from **Paragraph 7.57 on page 95**, while first the technical infrastructure is detailed, the arrangement of which is shown on **Figure 1.2 of ES Volume 3 - Figures**.

Solar Array

7.3 An array of ground-mounted solar photovoltaic panels is set out within a fenced area of approximately 72.4 hectares. The export capacity of the array is up to 49.9MW (3 S.F.).

7.4 The panels are typically grouped in blocks (or 'racks') of panels that are arranged in two rows of 26 panels in portrait format. Half 'racks' of 2 rows by 13 columns of panels are used to infill smaller areas.

7.5 Candidate model solar panels have been used for the purpose of the EIA, details of a typical panel are provided in **Figure 7.1 of ES Volume 3**.

7.6 The final solar panel model choice and dimensions will be selected prior to construction and will be within the parameters described from **Paragraph 7.7** below.

Panel Frames and Anchors

7.7 The solar panels will be mounted on frames at an angle of approximately 20 to 25 degrees, with a maximum height of 3.0m (as has been assessed in **Chapter 10 - Landscape and Visual Impact Assessment (LVIA)**). The frames that support the panels are typically made of aluminium or galvanised steel simply pushed in to the ground. Typical frame details are provided at **Figure 7.2 of ES Volume 3** and shown at **Plate 7.1**.



Plate 7.1 - Typical Ground-Mounted Solar Array on Frame

- 7.8 The lower edge of the panels will be a minimum of 0.8m above the ground to avoid shading from meadow planting beneath the panels.
- 7.9 Space between frames is provided for maintenance access and to minimise shading from neighbouring panels (**Figure 7.2, ES Volume 3**).

Site Access Tracks

- 7.10 Access to the site is required during construction, through operation, and finally during the decommissioning of the site at the end of the project's operational life. Internal tracks provide access to the BESS and substation compound and site transformers.
- 7.11 The proposed development will be accessed from Wilbraham Road, using existing farm entrances and farm tracks, crossing the Heath Road Byway Open to all Traffic (BOAT). This access point and tracks already take agricultural vehicles and therefore Heavy Goods Vehicles (HGVs). This is further discussed in the **Traffic and Access Statement** that accompanies the application.
- 7.12 The first 1km of access track is within South Cambridgeshire District. The remaining development is within East Cambridgeshire.

- 7.13 It is proposed that existing field entrances will be utilised and upgraded, where necessary, to allow access to the solar array transformer, BESS and substation compound.
- 7.14 Where sections of new, upgraded or widened access track are required, these will have the appearance of typical vernacular farm tracks with a crushed stone running surface (**Plate 7.2**) that will grass over in time. Typical detail is shown in **Figure 7.3 (ES Volume 3)**, the running surface (typically 4m wide) is laid over a permeable stone sub-surface on a surface-mounted geogrid base (e.g. Geotex).
- 7.15 The track will be permeable and no formal drainage is proposed. Water drainage off the track has also been considered in the track design and layout, and is assessed in the Flood Risk Assessment that accompanies the application.
- 7.16 The on-site access tracks within the renewable energy park need to remain in place through the lifetime of the project to facilitate access for routine maintenance.



Plate 7.2 - Typical New Site Access Track

Inverters and Transformers

- 7.17 The solar panels generate Direct Current (DC) electricity, which must be converted to electricity with an Alternating Current (AC) before it is exported into the local distribution network. This conversion will be undertaken by string inverter units located behind the panels, and mounted onto the frame.
- 7.18 Each inverter unit is typically 100cm x 70cm x 37cm and approximately 232 would be required (**Plate 7.3 on page 91**). The panels and inverters are connected via cabling which is mounted onto the panel frames

or suspended behind the panels. Underground communications and power cables link the inverters to the transformer units.

7.19 The transformers raise the voltage of the generated electricity to minimize electrical losses within the site. They are typically mounted in standard container units or GRP cabinets.

7.20 Approximately nine transformer units would be required, each unit would be approximately 6.1m long, 2.4m wide and 2.9m tall (**Plate 7.4 on page 91**). Typical detail is provided in **Figure 7.4 (ES Volume 3)**. The external finish will be agreed with the Local Planning Authority prior to construction commencing.



Plate 7.4 - Typical Transformer



Plate 7.5 - Typical Steel Storage Unit



Plate 7.3 - Typical string-inverter units

Customer Cabin

7.21 A single on-site customer cabin will contain the security and solar farm control systems, equipment for general maintenance and spare parts, should they be needed during the operational phase. These are glass reinforced plastic (GRP) or steel container-based cabinets typically 6.1m long, 2.4m wide and 2.9m high.

7.22 **Plate 7.5** shows a typical container-based cabinet. A drawing of a typical customer cabin is provided as **Figure 7.5 (ES Volume 3)**. The external finish will be agreed with the Local Planning Authority prior to construction commencing.

Cables and Conduits

7.23 The solar panels are electrically connected to each other, with connections made for:

- electronic communication and control;
- low voltage power supply for the monitoring and operating systems;
- high voltage power export cables; and
- broadband telecommunication for remote site monitoring and management.

- 7.24 Cables between solar panels in the same row are hung in ducts fixed along the back of panels to the end of the row.
- 7.25 All connection cables will be run across the site in underground cable trenches. The typical detail of the cable trenches are shown on **Figure 7.6 (ES Volume 3)** and are designed to ensure safety and avoid disturbance from agricultural equipment and activities.



Plate 7.6 - Typical Site Perimeter Fence

Security

- 7.26 A perimeter fence would be installed to protect the panels from theft. The fence will be stock style fencing with wooden posts and open wire mesh up to 1.8m tall (as shown at **Plate 7.6**). A typical fence and accompanying wire mesh gate detail is shown in **Figure 7.7 (ES Volume 3)**. There will be a single gate at the site entrance from the existing farm track.
- 7.27 A 15cm gap at the base of the fence would allow the passage of small animals. Access points for wildlife will be included in the fence line to ensure permeability across habitat.

- 7.28 Inward facing CCTV cameras will be located around the perimeter of the site. Cameras will be positioned on posts that are up to 2m tall, typical detail is shown in **Figure 7.8 (ES Volume 3)**.

Lighting

- 7.29 No visible lighting is proposed as part of the Six Oaks Renewable Energy Park for the operational period. Lighting associated with CCTV Cameras will be infrared and not visible to the naked eye.
- 7.30 During the construction phase, temporary lighting may be required

should deliveries be scheduled for after dusk, and security lighting on a sensor is typically utilised for the construction phase whilst machinery and materials are stored on site. Any lighting on site during the construction phase will be kept to a minimum to avoid disturbance to local residents and ecological species as far as practically possible whilst operating a safe site.

Battery Energy Storage System

- 7.31 The BESS (along with the substation compound) will occupy an area of approximately 1.1ha.
- 7.32 There are various battery technologies available, each having their own arrangement of battery modules, power conversion systems, and transformers. **Plate 7.7 on page 93** shows a typical BESS.
- 7.33 The proposed BESS would comprise approximately 28 containerised battery modules. Rated at approximately 100MWh, the BESS would be able to provide a continuous 50MW output over a 2 hour period.
- 7.34 A Power Conversion System (PCS) unit converts the Direct Current (DC) electricity of the battery to the