# Springwell Solar Farm

## Environmental Statement

Volume 1
Chapter 8: Climate

APFP Regulation 5(2)(a)

Planning Act 2008

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

EN010149/APP/6.1
November 2024
Springwell Energyfarm Ltd

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# 8. Climate

## 8.1. Introduction

8.1.1. This chapter presents an assessment of likely significant effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development upon Climate. The full description of the Proposed Development is provided within **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**.

8.1.2. This chapter is supported by the following appendices presented in **ES Volume 3 [EN010149/APP/6.3]**:

- **Appendix 8.1**: **Raw Data and Emissions Factors**.

8.1.3. This chapter should be read in conjunction with the following chapter presented in **ES Volume 1 [EN010149/APP/6.1]**:

- **Chapter 15: Water**.

## 8.2. Legislative framework, planning policy and guidance

8.2.1. This assessment has been undertaken with regard to the following legislation, planning policy and guidance.

8.2.2. It should be noted that this chapter does not assess the compliance of the Proposed Development against relevant planning policy. Such an assessment is presented in the **Planning Statement [EN010149/APP/7.2]**.

### International treaties

- The 2015 Paris Agreement **[Ref. 8-1]**;
- United Nations Framework Convention on Climate Change **[Ref. 8-2]**;
- Kyoto Protocol **[Ref. 8-3]**;

### Legislation

- Climate Change Act 2008 (2050 Target Amendment) Order 2019 **[Ref. 8-4]**;

### National planning policy

- Overarching National Policy Statement for Energy (NPS EN-1) (2023) – Section 3 sets out the importance of National Significant Infrastructure Projectss and explicitly includes solar generation within its scope. Section

5.3 details the requirement for a greenhouse gas (GHG) assessment as part of the Environmental Statement (ES) **[Ref. 8-5]**;

- National Policy Statement for Renewable Energy (NPS EN-3) (2023) - Section 2.10 contains details on solar energy **[Ref. 8-6]**;
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023) – Section 2.3 references requirements related to resilience to climate change **[Ref. 8-7]**;
- National Planning Policy Framework (NPPF) (2023) - Section 14 describes how to meet the challenge of climate change, flooding and coastal change. Consultation on the proposed reform to the NPPF ended on the 24 September 2024. The **Planning Statement [EN010149/APP/7.2]** considers both the current and consulted NPPF **[Ref. 8-8]**.
- British Energy Security Strategy (Department for Business, Energy & Industrial Strategy, and Department for Energy Security & Net Zero, 2022) **[Ref. 8-9]**;
- Energy White Paper: Powering our Net Zero Future (2020) **[Ref. 8-10]**; and
- Powering Up Britain (2023) **[Ref. 8-11]**.

## Local planning policy

- North Kesteven Climate Emergency Action Plan (2024) – Theme 7, Energy, highlights the Council's intention to reduce fossil fuel dependence through a transition to renewable forms of energy **[Ref. 8-12]**.

## Guidance

- Assessing Greenhouse Gas Emissions and Evaluating their Significance (Institute of Environmental Management and Assessment (IEMA), 2022) **[Ref. 8-13]**;
- PAS 2080 - Carbon management in Infrastructure (British Standards Institute, 2023) **[Ref. 8-14]**;
- Planning Practice Guidance on Climate Change (Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities, 2019) **[Ref. 8-15]**;
- A Corporate Accounting and Reporting Standard (The Greenhouse Gas Protocol, 2004) **[Ref. 8-16]**; and
- Whole Life Carbon Assessment for the Built Environment (Royal Institution of Chartered Surveyors, 2023) **[Ref. 8-17]**.

## 8.3. Stakeholder engagement

8.3.1. **Table 8.1** provides a summary of the stakeholder engagement activities undertaken separately from the Environmental Impact Assessment (EIA) scoping, non-statutory consultation, statutory consultation and targeted consultation process in support of the preparation of this assessment, as well as detailing the matters raised, how such matters have been addressed, and where they have been addressed in the ES.

8.3.2. **ES Volume 3, Appendix 5.3: Scoping Opinion Response Matrix [EN010149/APP/6.3]** presents the responses received via the Scoping Opinion and the Applicant's responses to each matter raised.

8.3.3. Appendix A-4, J-1, J-2 and K-3 of the **Consultation Report [EN010149/APP/5.1]**, which is submitted in support of the Development Consent Order (DCO) Application, sets out the feedback received during non-statutory, statutory and targeted consultation and how regard has been afforded by the Applicant to each matter raised.

Table 8.1 Summary of stakeholder engagement

| Consultee | Date of engagement | Summary of matters raised | How this matter has been addressed | Location of where this matter is addressed in the ES |
|---|---|---|---|---|
| North Kesteven District Council Climate Change Manager | 05 July 2024 | North Kesteven District Council Climate Change Manager agreed with the proposed methodology for the incorporation of the National Grid Navenby Substation into the climate assessment. | The emissions associated with the National Grid Navenby Substation have been included within **ES Volume 1, Chapter 16: Cumulative Effects [EN010149/APP/6.1]** and not as part of the lifecycle assessment for the Proposed Development. | **ES Volume 1, Chapter 16: Cumulative Effects [EN010149/APP/6.1]** presents the emissions associated with the National Grid Navenby Substation. |

## 8.4. Approach to the assessment

### Study area

8.4.1. The sensitive receptor for GHG emissions is the global climate, which is considered highly sensitive to GHG fluctuations. By proxy, this can also be extended to the United Kingdom's (UK) commitments under the UK Climate Change Act 2008 (2050 Target Amendment) Order 2019 **[Ref. 8-4]**, which aligned with the goals of the 2015 Paris Agreement **[Ref. 8-1]**, to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.

8.4.2. The Proposed Development has the potential to affect the climate by the addition and avoidance of GHG emissions in comparison to the baseline and future baseline scenario.

8.4.3. The scope of the GHG assessment includes the addition of GHG emissions directly from construction, operational (including maintenance) and decommissioning activities undertaken within the Order Limits, including project fuel consumption (during construction and decommissioning).

8.4.4. It also extends to include emissions which will occur outside the Order Limits, but related to the activities of the Proposed Development, including those from:

- the extraction, manufacture, and transportation of materials to the construction site (construction and operation (including maintenance));
- the transportation of workers to the Site (construction and operation (including maintenance)); and
- Off-site transport and disposal of waste materials (construction, operation (including maintenance) and decommissioning).

8.4.5. This assessment also considers the GHG savings from the Proposed Development as a result of displacing fossil-fuel based energy in the national electricity network.

### Scope of the assessment

8.4.6. The scope of this assessment has been established throughout the EIA process and design of the Proposed Development. Further information can be found in **ES Volume 1, Chapter 5: Approach to the EIA [EN010149/APP/6.1]**.

8.4.7. This section provides an update to the scope of the assessment from that presented in the EIA Scoping Report which is located in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and re-iterates/updates the evidence base for scoping matters in or out following further iterative assessment.

## Receptors/matters scoped into the assessment

8.4.8. **Table 8.2** presents the receptors/matters that are scoped into the assessment reported within this ES, together with appropriate justification.

### Table 8.2 Receptor/matters scoped into the assessment

| Receptor/matter | Phase | Justification |
|---|---|---|
| GHG emissions | Construction | Embodied carbon of Solar photovoltaic (PV) modules (e.g., the emissions from manufacture, processing and transport of materials) can be relatively high and construction-related emissions should be considered in relation to overall lifecycle emissions of the Proposed Development, to determine an accurate 'carbon-payback' time of the Proposed Development. |
| | Operation (including maintenance) | Given the proposed operational life of 40 years per phase, the cumulative effect of GHG reductions associated with the operation (including maintenance) of the Proposed Development will likely provide significantly beneficial effects. |
| | Decommissioning | The decommissioning process is likely to result in GHG emissions, particularly from disposal of Solar PV modules and any Battery Energy Storage System (BESS). It is important to include all emissions when considering the overall lifecycle emissions of the Proposed Development, to determine an accurate 'carbon payback' time for the Proposed Development. |
| In-combination climate change impacts | Operation (including maintenance) | Requested to be included by the Scoping Opinion in consideration of the Solar PV modules' "potential to alter precipitation runoff rates and patterns". |

## Receptors/matters scoped out of the assessment

8.4.9. **Table 8.3** presents the receptors/matters that are scoped out of the assessment that are therefore not considered as part of this ES, together with appropriate justification.

Table 8.3 Receptor/matters scoped out of the assessment

| Receptor/matter | Phase | Justification |
|---|---|---|
| Climate resilience | Construction, operation (including maintenance) and decommissioning | The UK Climate Projections published in 2018 (UKCP18) **[Ref. 8-24]** projections suggest that climate change will lead to hotter drier summers, warmer wetter winters, increased likelihood of extreme weather events (e.g., heat waves, high rainfall events) and sea level rise of up to 1.15 m (by 2070 in London, assuming a high-emissions scenario). Due to the embedded resilience of Solar PV modules to high heat and wind speeds; low risk of flooding at the Site; and the Site's distance from the coast, these factors are not expected to significantly impact the construction, operation (including maintenance) or decommissioning of the Proposed Development.<br><br>The Scoping Opinion confirmed that climate resilience can be scoped out of further assessment, on the basis that **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]** sufficiently explains how the Proposed Development has been designed to be resilient to the impacts of climate change (which, in the opinion of the Applicant, it does). |

## Establishing baseline conditions

### Data sources to inform the EIA baseline characterisation

8.4.10. Data required to undertake the lifecycle GHG assessment in **paragraph 8.4.29** is provided in **ES Volume 3, Appendix 8.1: Raw Data and Emission Factors [EN010149/APP/6.3]**.

### Site visits/surveys

8.4.11. No surveys or site visits specific to climate have been undertaken to inform this assessment.

## Approach to design flexibility

8.4.12. The Project Parameters, as outlined in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**, **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]** and the parameter plans presented in **ES Volume 2, Figure 3.1 – 3.4 [EN010149/APP/6.2]**, set out the reasonable 'worst-case' parameters for the Proposed Development.

8.4.13. **ES Volume 1, Chapter 5: Approach to the EIA [EN010149/APP/6.1]**, sets out those elements of the Proposed Development for which optionality is present within the design.

### Table 8.4 Reasonable worst-case assessed for climate

| Project element | Reasonable worst-case scenario that has been assessed |
|---|---|
| Solar PV development | This assessment has considered the maximum extent of Solar PV modules as outlined in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]** to consider a reasonable worst-case. |
| Balance of Solar System (BoSS) – Inverters | The inverters which form part of the BoSS would comprise either string inverters which are placed underneath the Solar PV modules or central inverters which are sited at regular intervals amongst the Solar PV modules. A hybrid option of both options is embedded into the design. The detailed list of each field and inverter type is detailed and secured in **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]**. |

## Assessment assumptions

### Construction

8.4.14. To estimate construction fuel use, an indicative plant list has been used, consisting of:

- Three excavators, 13 tonne;
- Four Excavators, 22.5 tonne;
- Three Excavators, 36 tonne;
- Ten Dump Trucks;
- Twenty-four Piling Rigs; and
- Twenty-eight Loaders.

8.4.15. It is assumed that plant will be in operation six days per week, 12 hours a day at 50% capacity over the 48-month construction period to provide a worst-case scenario. Typical fuel efficiency data (litres used per hour) has been sourced from publicly available sources.

8.4.16. To estimate construction worker transportation, it has been assumed that 650 construction workers would travel a one-way commuting distance of 25km. Workers would travel 6 days per week via car, with an average of 1.5 workers per vehicle. This is aligned with assumptions assessed and outlined in **ES Volume 1, Chapter 14: Traffic and Transport [EN010149/APP/6.1]**.

8.4.17. It has also been assumed that construction workers would consume and otherwise use 45 litres of water per day, per person, during construction **[Ref. 8-18]**.

8.4.18. To estimate emissions from material delivery and wastage, relevant Royal Institution of Chartered Surveyors (2023) guidance assumptions have been applied **[Ref. 8-17]**, in conjunction with assumptions provided by the Applicant. The Applicant has provided the approximate source location and anticipated waste rates for all key components, (e.g., Solar PV modules and BESS). The source location of the products and materials used to construct the Proposed Development are summarised below:

- Solar PV, BESS, BESS containers/control containers, inverter transformer stations, switchgear and inverters sourced from Asia.
- Solar PV frames, foundations (steel piling only) and transformers sourced from Europe.
- Cabling, aggregates, stone, concrete and fencing sourced locally.

## Operation (including maintenance)

8.4.19. To account for changes in energy generation over the operation (including maintenance) of the Proposed Development, a degradation factor of 0.4% has been applied each year to account for year-on-year reduction in yield.

8.4.20. To estimate emissions associated with replacement of assets over the 40 years per phase service life of the Proposed Development, the following assumptions have been applied (**Table 8.5**). Assets with a service life of 40 years per phase would not require any replacement.

Table 8.5 Service life of the Proposed Development components

| Item | Service life (years) |
|---|---|
| Solar PV | 40 |
| Solar PV frames | 40 |
| Solar PV foundations | 40 |
| BESS | 17.5 |
| BESS containers / control containers | 40 |
| Switchgear | 30 |
| Inverters | 10 |
| Inverter Transformer Stations | 40 |
| Transformers | 40 |
| BESS building | 40 |
| Main Collector Compound building | 40 |
| Cables | 40 |
| Concrete | 40 |
| Aggregates and stone | 40 |
| Fencing | 40 |

8.4.21. The emissions associated with the construction of the BESS and Main Collector Compound buildings have been modelled using One Click LCA software (a life cycle assessment tool for calculating building and infrastructure whole life carbon emissions), and a 40 years per phase service life has been applied. However, replacement of individual parts/elements of the buildings would likely be required and is therefore accounted for within the model. Therefore, there are some replacement emissions associated with these assets despite a 40 years per the Institute of Environmental Management and Assessment service life being applied.

8.4.22. The following assumptions have been applied to estimate emissions associated with workers and maintenance visits during operation:

- 24 daily workers with a one-way commuting distance of 25km, all travelling via diesel van;
- 15 annual maintenance visits for Solar PV washing and grass cutting, each with a one-way commuting distance of 25km and all travelling via diesel van; and
- Two annual technician visits, one-way commuting distance of 100km and travelling via diesel van.

8.4.23. Emissions associated with water consumption and treatment for Solar PV modules cleaning have also been estimated. Based on publicly available information **[Ref. 8-19]**, it has been assumed that 76 litres of water would be required per MWh of anticipated annual generation. The initial year's expected generation has been applied and the water use projected onto subsequent years.

8.4.24. Finally, emissions associated with repair are assumed to equal 25% of emissions associated with maintenance, as per Royal Institution of Chartered Surveyors 2023 guidance **[Ref. 8-17]**.

## Decommissioning

8.4.25. It has been assumed that the majority of all materials would be recycled at end of life, with a very small proportion sent to landfill. This has largely been based on publicly available data from disposal scenarios available in Environmental Product Declarations used. All emission factors and Environmental Product Declarations used can be found in **ES Volume 3, Appendix 8.1: Raw Data and Emission Factors [EN010149/APP/6.3]**.

8.4.26. For decommissioning fuel use (fuel required by plant to deconstruct the Proposed Development), it has been estimated that the fuel required would be 50% of the fuel used during the construction stage, as per Royal Institution of Chartered Surveyors (2023) guidance **[Ref. 8-17]**.

8.4.27. An off-site disposal distance of 100km has been applied to estimate emissions from transportation of waste materials from the Site to waste processing facilities at end of life. This is a conservative distance based on access to specialist construction recycling facilities.

8.4.28. IEMA's *Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance* (2022) **[Ref. 8-13]** states *"activities that do not significantly change the result of the assessment can be excluded where expected emissions are less than 1% of total emissions, and where all such exclusions total a maximum of 5% of total emissions; all exclusions should be clearly stated"*. The expected emissions of the change in land use from grassland to agriculture following decommissioning are expected to be less than 1% of total emissions and therefore are not considered further.

## Assessment methodology and criteria

8.4.29. This GHG assessment establishes existing and future baseline GHG emissions. Aligned with the GHG Protocol **[Ref. 8-16]**, it quantifies applicable Kyoto Protocol **[Ref. 8-3]** GHGs as measured in tonnes of carbon dioxide equivalence ($tCO_2e$), where equivalence means having the same warming effect as $CO_2$ over 100 years. The six original Kyoto Protocol gas groups are $CO_2$, methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFCs), sulphur hexafluoride ($SF_6$) and perfluorocarbons (PFCs). Nitrogen trifluoride ($NF_3$), a chemical released in certain high-tech industries, was added in 2013. The global warming potential of each is presented in **Table 8.6**.

Table 8.6 Kyoto Protocol GHGs and their global warming potential based upon Intergovernmental Panel on Climate Change's Fifth Assessment Report

| Greenhouse gas/group | Chemical formula | Global warming potential ($CO_2e$) |
|---|---|---|
| Carbon dioxide | $CO_2$ | 1 |
| Methane | $CH_4$ | 28 |
| Nitrous oxide | $N_2O$ | 265 |
| Hydrofluorocarbons | HFCs | Depends on specific gas |
| Sulphur hexafluoride | $SF_6$ | 23,900 |
| Perfluorocarbons | PFCs | Depends on specific gas |
| Nitrogen Trifluoride | $NF_3$ | 16,100 |

8.4.30. Data associated with the activities contributing to the construction phase of the Proposed Development have been provided by the Applicant. Where it has not been possible to provide this data, as this assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks, and proxy data such as distance travelled) have been used. Emissions have then been quantified by applying the most relevant and up-to-date emission factors. All supporting data used is available in **ES Volume 3, Appendix 8.1: Raw data and emission factors [EN010149/APP/6.3]**.

8.4.31. An emission factor is a representative value that relates the quantity of a pollutant released into the atmosphere with an activity associated with the release of that pollutant. Emission factors are typically available from government publications, independent agencies, and scientific research journals. However, the quality and accuracy of such factors can vary

significantly. Factors can differ depending on the research body and/or underlying methodologies applied. It is, therefore, good practice to apply emission factors only from reputable sources.

8.4.32. The approach to this GHG assessment follows the GHG Protocol's core principles:

- **Relevance**: selecting an appropriate inventory boundary that reflects the GHG activities of the Proposed Development and serves the decision-making needs of users.
- **Completeness**: accounting for all emission sources within the chosen inventory boundary, with any specific exclusions disclosed and justified.
- **Consistency**: aiming to collect meaningful and consistent data over time whilst transparently documenting any significant changes to data quality and/or format.
- **Transparency**: addressing all relevant issues in a coherent and clear manner.
- **Accuracy**: minimising uncertainty and avoiding systematic over- or under-quantification of emissions, and ensuring any necessary estimates or assumptions required are conservative and guided by industry standards.

8.4.33. In line with the GHG Protocol and the Institute of Environmental Management and Assessment (IEMA) guidance **[Ref. 8-13]**, a materiality threshold of 1% may be set whereby emissions that are expected to contribute to less than 1% of the overall emissions inventory may be excluded from the assessment.

8.4.34. Emissions from materials have been quantified by utilising One Click LCA, scientific research papers, Environmental Product Declarations, Inventory of Carbon and Energy (University of Bath, 2019) **[Ref. 8-20]** and Department for Energy Security and Net Zero's (2023) **[Ref. 8-21]** conversion factors to use the most accurate densities and emission factors as possible.

8.4.35. Conversions between mass, volume and area have been calculated where appropriate to allow the application of specific emissions factors. Details of emission factors used have been included in **ES Volume 3, Appendix 8.1: Raw data and emission factors [EN010149/APP/6.3]**. In addition, some material types, build ups, weights and dimensions have been based on publicly available information, where required.

## Assessment criteria and assessment of significance

8.4.36. Impact assessments normally assess to what degree a development will affect the baseline environment of the study area. In the case of GHG emissions, any emissions will have a long-term, irreversible negative effect

on the global climate, which is considered to be highly receptive to any emissions of GHGs. A specific source of GHG emissions cannot be linked to impacts at a specific location, but would have impacts globally.

8.4.37. This GHG assessment therefore evaluates the significance of emissions based upon IEMA guidance **[Ref. 8-13]**, which provides a framework for determining significance against the goals of the 2015 Paris Agreement (i.e., against a science-based 1.5°C trajectory) (see **Table 8.7**).

8.4.38. The IEMA guidance **[Ref. 8-13]** acknowledges that some projects may replace existing development or baseline activity with a higher GHG profile and thus the significance of a project's emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible. It states that significance should not be determined purely on the magnitude of GHG emissions, but whether a project contributes to reducing GHG emissions consistent with a trajectory towards net zero by 2050.

8.4.39. If GHG emissions cannot be avoided, a goal of the EIA process should be to identify mitigation options to reduce a project's residual emissions at all stages. If GHG emissions remain significant but cannot be further reduced, approaches to compensate a project's remaining emissions should be considered.

Table 8.7 Framework for assessment of significant GHG effects

| Significance | Level | Criteria |
|---|---|---|
| Significant | Major adverse | Project adopts a business-as-usual approach, not compatible with the national Net Zero trajectory, or aligned with the goals of the 2015 Paris Agreement (i.e., a science-based 1.5°C trajectory). GHG impacts are not mitigated or reduced in line with local or national policy for projects of this type. |
| | Moderate adverse | Project's GHG impacts are partially mitigated, and may partially meet up-to-date policy; however, emissions are still not compatible with the national Net Zero trajectory, or aligned with the goals of the 2015 Paris Agreement. |
| Not significant | Minor adverse | Project may have residual emissions, but the project is compatible with the goals of the 2015 Paris Agreement, complying with up-to-date policy and good practice. |
| | Negligible | Project has minimal residual emissions and goes substantially beyond the goals of the |

| Significance | Level | Criteria |
|---|---|---|
| | | 2015 Paris Agreement, complying with up-to-date policy and best practice. |
| Significant | Beneficial | Project causes GHG emissions to be avoided or removed from the atmosphere, substantially exceeding the goals of the 2015 Paris Agreement with a positive climate impact. |

## 8.5. Environmental baseline

### Existing 2024 baseline

8.5.1. The Site mainly consists of agricultural land, predominantly fields interspersed with hedgerows, small woodland blocks and farm access tracks. It is used for arable production but with limited livestock use, e.g., sheep rearing. The GHG baseline comprises the existing carbon stock and possible minor emissions sources. These minor emissions sources may comprise vehicle fuel and fertiliser use, with possible contributions from the land depending on soil and vegetation types. In line with the IEMA guidance **[Ref. 8-13]**, if a site currently has no development or significant activity, the baseline can be considered to have zero GHG emissions, to ensure a reasonable worst-case approach to establishing the net GHG effect.

### Future baseline in the absence of the Proposed Development

8.5.2. No change is expected for the future baseline when compared to the current baseline, with regards to GHG emissions. It is unlikely that under a future 'business-as-usual' scenario there would be any significant changes to the amount of GHG emissions from the Site, either positive or negative.

8.5.3. As an in-combination assessment of the Proposed Development's "potential to alter precipitation runoff rates and patterns" has been scoped into the assessment, future baseline precipitation data is presented below. The climate projections displayed in **Table 8.8** have been extracted from the UKCP18 data developed by the UK Climate Impacts Programme **[Ref 8-24]**. The projections displayed cover the indicative lifetime of the Proposed Development at the 10$^{th}$, 50$^{th}$ and 90$^{th}$ probability level for the Relative Concentration Pathway 4.5 (intermediate emissions) and Relative Concentration Pathway 8.5 (high emissions) scenario.

Table 8.8 Projected change in precipitation rate in East Midlands region, showing 50th,10th and 90th percentile

| Climate variable | Relative Concentration Pathway 8.5 | |
|---|---|---|
| | 2020 – 2039 | 2040 – 2059 |
| Annual precipitation rate anomaly (%) | +1.6 (-5.7 to + 9.0) | -2.1 (-11.1 to + 6.9) |
| Summer precipitation rate anomaly (%) | -4.7 (-25.1 to +15.4) | -14.9 (-40.0 to +10.1) |
| Winter precipitation rate anomaly (%) | +5.2 (-4.3 to +15.2) | +7.6 (-4.5 to +21.3) |

8.5.4. Total annual precipitation in the East Midlands area is expected to increase in the short term (2020 – 2039) and decrease in the longer term (2040 – 2059); however, summer rainfall is expected to decrease and winter rainfall is expected to increase across both time frames. The range of probabilities is highly variable. The frequency and magnitude of extreme precipitation events is predicted to increase due to climate change.

## 8.6. Mitigation embedded into the design

8.6.1. This assessment has been based on the principle that measures have been 'embedded' into the design of the Proposed Development to remove potential significant effects as far as practicable, for example by the considered placement of infrastructure. **ES Volume 1**, **Chapter 3: Proposed Development Description [EN010149/APP/6.1]** and **ES Volume 3**, **Appendix 3.1: Project Parameters [EN010149/APP/6.3]**, identifies the mitigation that have been embedded into the design of the Proposed Development. The embedded mitigation relevant to this assessment is detailed in **Table 8.9** below.

Table 8.9 Embedded mitigation relevant to climate

| Embedded mitigation measures relevant to climate | Function | Securing mechanism |
|---|---|---|
| Any vegetation cleared for the Proposed Development will be compensated by a planting scheme that equals | This ensures that there is no carbon sequestration potential loss. | **Outline Landscape and Ecology Management Plan [EN010149/APP/7.9]** |

| Embedded mitigation measures relevant to climate | Function | Securing mechanism |
|---|---|---|
| or exceeds the current levels of vegetation. | | |
| Lean design to minimise use of concrete, steel, aggregates, etc. | Minimising the use of construction materials reduces product stage emissions associated with the construction of the Proposed Development. | **Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]** |

## 8.7. Assessment of likely effects (without additional mitigation)

8.7.1. GHG emissions associated with the Proposed Development have been reported using the modular structure as outlined in Royal Institution of Chartered Surveyors (2023) guidance **[Ref. 8-17]**. The reporting modules are defined as follows:

- A1-3 product stage – this category includes the embodied emissions of materials used to construct the Proposed Development. It includes the emissions associated with raw material extraction, transport to the manufacturing site and manufacturing emissions.
- A4 transport – this comprises the emissions associated with the transport of materials from the manufacturing site to the construction site.
- A5 construction and installation – this source includes four sub-categories which include emissions from pre-construction demolition (if applicable), construction activities (such as equipment fuel use), material wastage and construction worker transport.
- B1 in-use emissions – emissions associated with refrigerant gas leaks (if applicable) and emission release from products or reabsorption into products (such as sequestration from timber).
- B2-5 maintenance, repair, replacement and refurbishment – this includes emissions associated with routine maintenance (B2), repair (B3), replacement of materials (B4) and any planned refurbishment (B5).
- B6 operational energy – energy used during the operation of the asset.
- B7 operational water – water used during the operation of the asset.
- B8 user activities not covered in B1-7 – emissions may include transport of persons to and from the asset during operation, for example.

- C1-4 end of life – this category includes deconstruction and demolition emissions (C1), transport of waste materials from the Site to disposal sites (C2), waste processing for recycling (C3) and disposal emissions from landfill (C4).

8.7.2. Results within the tables of this chapter are accurate to the number of significant figures presented. Any inconsistencies in totals versus individual values are due to rounding and should not be viewed as erroneous.

## Construction

8.7.3. The GHG assessment of construction emissions has calculated the life cycle emissions for the building materials and systems, accounting for their embodied emissions, construction, maintenance, repair and replacement emissions.

8.7.4. **Table 8.10** provides an indication of the key emissions sources that are anticipated during the construction phase of the Proposed Development.

8.7.5. The total construction GHG emissions are 1,865,557 $tCO_2e$, with 93% comprising those from the product stages (modules A1-3) and 7% from construction processes (modules A4-5).

Table 8.10 Construction phase GHG emissions

| Description | Emissions ($tCO_2e$) | Proportion of emissions (%) |
|---|---|---|
| Product Stage (A1-3) | 1,739,263 | 93% |
| Construction Process Stage (A4-A5) | 126,295 | 7% |
| **Total** | **1,865,557** | **100%** |

8.7.6. The largest emission sources from the A1-3 product stage are from the Solar PV modules (58%) and BESS (32%) comprising 1,739,263 $tCO_2e$ of the total embodied emissions. A breakdown of the embodied emissions sources for the different components is provided below in **Table 8.11**.

Table 8.11 Embodied GHG emissions from the manufacture of materials and components

| Component | Emissions ($tCO_2e$) | Proportion of emissions (%) |
|---|---|---|
| BESS | 560,000 | 32% |

| Component | Emissions ($tCO_2e$) | Proportion of emissions (%) |
|---|---|---|
| BESS containers | 11,570 | 1% |
| Solar PV modules | 1,009,733 | 58% |
| Inverters | 8,661 | <1% |
| PV framework | 12,555 | 1% |
| PV foundations | 41,937 | 2% |
| BESS and main collector compound building | 976 | <1% |
| Transformers | 5,278 | <1% |
| Inverter Transformer Stations | 844 | <1% |
| Cables | 79,414 | 5% |
| Concrete | 6,701 | <1% |
| Aggregate and stone | 422 | <1% |
| Fencing | 481 | <1% |
| Switchgear | 692 | <1% |
| **Total** | **1,739,263** | **100%** |

## Operation (including maintenance)

8.7.7. Total operational GHG emissions equal 954,474 $tCO_2e$, the majority of which (97%) come from the replacement of the BESS over the lifetime of the Proposed Development, as detailed in **Table 8.12**.

### Table 8.12 Operational GHG emissions

| Component | Emissions ($tCO_2e$) | Proportion of emissions (%) |
|---|---|---|
| BESS | 921,985 | 97% |
| BESS containers | No replacement | 0% |
| Solar PV modules | No replacement | 0% |
| Inverters | 27,749 | 3% |

| Component | Emissions ($tCO_2e$) | Proportion of emissions (%) |
|---|---|---|
| PV framework | No replacement | 0% |
| PV foundations | No replacement | 0% |
| BESS and Main Collector Compound Building | 11 | <1% |
| Transformers | No replacement | 0% |
| Inverter Transformer Stations | No replacement | 0% |
| Switchgear | 747 | <1% |
| PV cleaning | 1,105 | <1% |
| Worker transport | 2,877 | <1% |
| **Total** | **954,474** | **100%** |

## Decommissioning

8.7.8. GHG emissions from the decommissioning phase of the Proposed Development are estimated to total 184,765 $tCO_2e$. This estimate aligns with standard practice for life cycle assessments as detailed in **Table 8.13**. This phase includes emissions from decommissioning fuel use, transport of materials to disposal sites and emissions associated with recycling and landfill. These emissions are subject to a high level of uncertainty, as the decommissioning conditions cannot be predicted with any confidence 40 years per phase into the future.

Table 8.13 Anticipated key GHG emissions sources during the end of life stage

| Component | Emissions ($tCO_2e$) | Proportion of emissions (%) |
|---|---|---|
| End of life (C1-4) | 184,765 | 100% |
| **Total** | **184,765** | **100%** |

## Summary of GHG emissions

8.7.9. The predicted lifecycle GHG emissions of the Proposed Development are 3,004,796 $tCO_2e$. Product stage emissions are the largest emissions source (58%), followed by operational emissions (32%), as displayed in **Table 8.14**.

Table 8.14 Lifecycle GHG emissions from the Proposed Development

| Component | Emissions ($tCO_2e$) | Proportion of emissions (%) |
|---|---|---|
| Product Stage (A1-3) | 1,739,263 | 58% |
| Construction Process Stage (A4-A5) | 126,295 | 4% |
| Operation (B2-8) | 954,474 | 32% |
| End of life (C1-4) | 184,765 | 6% |
| **Total (not including GHG savings from operation)** | **3,004,796** | **100%** |

8.7.10. GHG emissions from the Proposed Development have been proportioned to the appropriate and available UK Carbon Budget cycle within the design life of the Proposed Development in **Table 8.15** (to date the UK has agreed up to the 6th Carbon Budget which runs from 2033 to 2037). Those emissions falling within the 4th Carbon Budget (2023 – 2027) are largest as they include all of the emissions from the product stage. These estimations have adopted a conservative approach, and are deemed to represent a reasonable worst-case scenario.

Table 8.15 UK Carbon budgets

| Carbon budget | Carbon budget level ($ktCO_2e$) | Estimated project emissions ($ktCO_2e$) | Project emissions as a percentage of UK carbon budget |
|---|---|---|---|
| 1st (2008 – 12) | 3,018,000 | N/A | N/A |
| 2nd (2013 – 17) | 2,782,000 | N/A | N/A |
| 3rd (2018 – 22) | 2,544,000 | N/A | N/A |
| 4th (2023 – 27) | 1,950,000 | 1771 | 0.091% |
| 5th (2028 – 32) | 1,725,000 | 166 | 0.010% |
| 6th (2033 – 37) | 965,000 | 72 | 0.007% |

8.7.11. The GHG emissions from the Proposed Development up until 2037 range between 0.007% and 0.091% of the UK carbon budget.

## GHG savings

8.7.12. GHG savings as part of the operation of the Proposed Development and the displacement of fossil-fuel derived electricity within the national electricity network are expected to be considerable and have been quantified below.

8.7.13. For the purposes of this assessment, the Proposed Development is anticipated to have an installed capacity of 650 – 800 MW, and generation of 840,000 – 1,090,000 MWh in the first year of operation. Taking an average of this range and taking into account an annual degradation factor of 0.4%, the total energy generation from the proposed 40 years per phase operational life is approximately 35,736,262 MWh. It is likely that the commencement of operation will be phased, with Phase 1 in 2028 and Phase 2 in 2030. However, for the purposes of this assessment, a conservative approach has been undertaken assuming that full operation occurs from 2030 onwards only.

8.7.14. Dividing the lifetime emissions of the Proposed Development (3,004,796 $tCO_2e$) by the lifetime energy generation (35,736,262 MWh) gives a total lifecycle carbon intensity value of 84.1 $gCO_2e/kWh$.

8.7.15. However, the total lifecycle carbon intensity value cannot be directly compared with the UK grid carbon intensity or projected future intensities, published by the Department for Energy Security and Net Zero and the Department for Business, Energy and Industrial Strategy (2024) **[Ref. 8-22]**. This is because those intensities comprise direct operational emissions only, and do not include emissions related to the fuel supply chain or maintenance activities. When calculating the GHG emissions from electricity based upon the fuel mix, renewable energy such as that from solar farms, is assumed to emit 0 g/kWh.

8.7.16. The Proposed Development will provide electricity to the national grid that may otherwise be generated by processes with higher carbon intensities, and the benefit of the Proposed Development, with regards to climate, is to replace the electricity generation from fossil fuels. Therefore, to assess the GHG savings of the Proposed Development, operational emissions from a Combined Cycle Gas Turbine have been used as a comparison, as it is currently the most carbon-efficient fossil-fuelled technology available.

8.7.17. In the July 2024 Decision Letter for Gate Burton Energy Park **[Ref. 8-25]** the Secretary of State commented that it considered a Combined Cycle Gas Turbine an inappropriate baseline for these comparisons as "*2011 NPS EN-1 requires all combustion power stations with a capacity over 300MW to be constructed Carbon Capture Ready*". This still holds true in NPS EN-1 (2023) **[Ref. 8-5]**. The future energy baseline is uncertain, and whilst there are requirements for all combustion power stations with a capacity over 300 MW to be constructed to be 'Carbon Capture Ready',

this does not guarantee the application of carbon capture technology, nor the timeframes to which it may be applied. The need for carbon abatement is immediate and technologies that can do so in the short-term, such as the Proposed Development, play a vital role in the pathway to Net Zero. As such, and in the absence of any more appropriate identified methodology, this assessment maintains that a comparison to Combined Cycle Gas Turbine emissions is a robust and appropriate method to understand the level of GHG savings from the Proposed Development.

8.7.18. The carbon intensity of a Combined Cycle Gas Turbine is 354 $gCO_2e/kWh$, and so the Proposed Development would emit 270 g fewer $CO_2e$ per kWh than if the same electricity were generated by a gas fired Combined Cycle Gas Turbine, representing savings of 76%. This is not a direct comparison, as the 84.1 $gCO_2e/kWh$ calculated here is a lifecycle carbon intensity value and the carbon intensity of the Combined Cycle Gas Turbine is assumed to represent operational emissions (not including maintenance, replacement and repair of components). This results in a conservative assessment of emissions savings for the Proposed Development.

8.7.19. Over the proposed 40 years per phase lifetime, the operation of the Proposed Development results in GHG savings of over 9.6 million tonnes $CO_2e$ when compared to Combined Cycle Gas Turbine-generated electricity. It should be noted that, like the UK grid carbon intensities published by the UK Government, this comparison does not account for the embodied carbon in the Combined Cycle Gas Turbine and is therefore a conservative estimate.

## In-combination impacts

8.7.20. It is not anticipated that the installation of the Solar PV modules will involve the introduction of significant hardstanding at ground level, ensuring minimal superficial cover compared to baseline. In addition, the Solar PV modules will have regular rainwater gaps to prevent concentration of water along a single drip line.

8.7.21. Climate change is likely to impact precipitation levels, as shown in **Section 8.5**. Whilst in the longer term (2040 – 2059) total annual precipitation is expected to decrease, winter precipitation is predicted to increase overall and extreme precipitation events are predicted to increase across all timelines.

8.7.22. Surface water run-off will be controlled using water management techniques informed by sustainable drainage systems. Further detail on the surface water flood risk and details on the Outline Surface Water Drainage Strategy are provided in **ES Volume 1, Chapter 15: Water [EN010149/APP/6.1]** and **ES Volume 3, Appendix 16.1: Flood Risk Assessment [EN010149/APP/6.3]**.

8.7.23. The Site will be planted with native species grassland and wildflower mixes. This planting will ensure that water that falls from the drip line will be intercepted by vegetation, promoting water interception and infiltration potential, and limiting channelisation from surface water run-off from the Solar PV modules.

## 8.8. Additional mitigation

### Construction

8.8.1. A large majority of GHG emissions associated with the Proposed Development comprise those embodied emissions from infrastructure, primarily the BESS and Solar PV modules. The most effective mitigation will therefore be in the responsible sourcing of materials and infrastructure.

8.8.2. All members of the supply chain will provide a carbon reduction plan where feasible, allowing for the optimisation of emissions associated with the supply chain. This measure will be secured in the **oCEMP [EN010149/APP/7.7]** which is submitted in support of the DCO Application. Use of products with lower embodied/pre-use phase emissions will significantly improve the carbon balance of the Proposed Development. This measure will also be secured in the **oCEMP [EN010149/APP/7.7]** which is submitted in support of the DCO Application.

8.8.3. In addition to procurement, the **oCEMP [EN010149/APP/7.7]**, includes measures to decrease GHG emissions from the construction process phase. These measures include:

- Implementing measures to decrease fuel use by maximising energy efficiencies, for example to ensure all vehicles switch off engines when stationary and ensure vehicles are well maintained and conform to current emissions standards.
- Promoting the use of sustainable fuels in vehicles, and where possible making use of electric vehicles to reduce fuel consumption.
- Using locally sourced and/or produced materials, where practicable. The use of recycled aggregates, where appropriate, for foundations, subbases, hard-standings and pavement materials.
- Actions to meet the waste hierarchy in accordance with the principles of the Government's Resources and waste strategy for England 2018 **[Ref. 8-23]**. Promoting the recycling of materials by segregating waste to be re-used and recycled where practical.

8.8.4. The **oCTMP [EN010149/APP/7.8]** will include measures to decrease GHG emissions, including liaising with construction staff to minimise GHG emissions associated with their commute to the Site, including provision of

staff minibuses, and promoting lower carbon modes of travel such as car sharing options and use of public transport.

### Operation (including maintenance)

8.8.5. As the overall impact on climate during this phase is positive, no additional mitigation measures are required.

8.8.6. The maintenance and replacement of components of the Proposed Development should be carried out in accordance with the additional mitigation measures set out above for the construction phase. These are detailed and secured in the **Outline Operational Environmental Management Plan [EN010149/APP/7.10]**.

### Decommissioning

8.8.7. It is anticipated that additional mitigation measures specific to the decommissioning phase will broadly emulate those set out for the construction phase. These are detailed and secured in the **Outline Decommissioning Environmental Management Plan [EN010149/APP/7.7]**.

## 8.9. Assessment of residual effects (with additional mitigation)

### Lifecycle emissions

8.9.1. Renewable energy developments such as the Proposed Development have a major role to play in the transition to a low carbon economy, and the decarbonisation of the UK national electricity network. Without projects such as the Proposed Development, the GHG intensity of the UK's electricity generation would not decrease as projected and would severely compromise the UK's ability to meet its carbon reduction targets.

8.9.2. GHG emissions are inherently cumulative, and so, aligned with the IEMA guidance **[Ref. 8-13]**, the significance of the impact of the Proposed Development on the global climate is determined from its lifecycle impact (i.e. lifecycle GHG emissions and savings).

8.9.3. Emissions from the construction, operation (including maintenance) and decommissioning of the Proposed Development total 3,004,796t$CO_2$e (**Table 8.14**), and the operation of the Proposed Development displaces 12.7 million t$CO_2$e that may have otherwise been emitted from gas-generated electricity. The net GHG savings, compared against equivalent gas-fired electricity generation, are therefore over 9.6 million tonnes of $CO_2$e.

8.9.4. The emissions payback period can be judged against operational emissions only, which is the methodology used by the Department for Energy Security and Net Zero and the Department for Business, Energy

and Industrial Strategy (2024) **[Ref. 8-22]** when calculating UK Grid carbon intensity, or against the entire lifecycle emissions of the Proposed Development. When assessed against operational emissions, the Proposed Development has an emissions payback period of 3 years. When assessed against lifecycle emissions, the Proposed Development has an emissions payback period of 10 years.

8.9.5. The Proposed Development is therefore considered likely to have a **beneficial significant** effect on the climate.

### In-combination impacts

8.9.6. Given the embedded mitigation proposed, it is deemed that there is **no significant risk** of the Solar PV modules altering precipitation runoff rates and patterns to have detrimental effects on the environment.

## 8.10. Opportunities for enhancement

8.10.1. Opportunities for environmental enhancement in relation to climate are detailed in the **Design Approach Document [EN010149/APP/7.3]** and **Planning Statement [EN010149/APP/7.2]** and have not been considered within this assessment.

8.10.2. The nature of the Proposed Development offers an enhancement to the original environment in terms of GHG emissions.

## 8.11. Monitoring requirements

8.11.1. There are no monitoring requirements in relation to the climate impact of the Proposed Development.

## 8.12. Difficulties and uncertainties

8.12.1. The following difficulties and uncertainties have been encountered in undertaking the climate assessment:

- The accuracy of a GHG assessment depends on the quality of the data provided. Primary data should be used where available; however, the fact that this assessment represents a forecast from a future scenario means that all data is ‘secondary’ (extrapolated, estimated or benchmarked). Assessments such as this, based largely on secondary data, should be viewed as an estimate of GHG emissions impact, and actual emissions may vary. To mitigate against this, a conservative approach has been adopted, whereby the most reasonable worst-case scenario has been assumed.
- While the emissions associated with the decommissioning phase of the Proposed Development have been quantified in this assessment, it is difficult to accurately determine the appropriate mitigation measures

that would be implemented during decommissioning due to the potential advancements in technology and best practice between the present and the time in which decommissioning will take place.

## 8.13. Summary

8.13.1. A summary of this assessment is presented in **Table 8.16**. Relevant embedded mitigation are identified, together with the potential effects that could arise. Any proposed additional mitigation measures are stated and the residual effects then assessed.

## Table 8.16 Assessment summary

| Receptor | Embedded mitigation | Potential effects (without additional mitigation) | Additional mitigation | Residual effect (with additional mitigation) | Monitoring requirement |
|---|---|---|---|---|---|
| GHG emissions | Members of the supply chain will provide a carbon reduction plan where feasible. The use of materials will be minimised through lean design. Vegetation loss will be compensated. | 9.6 million $tCO_2e$ saved over lifespan of the Proposed Development. | **oCEMP [EN010149/APP/7.7]** | 9.6 million $tCO_2e$ saved over lifespan of the Proposed Development<br>**Significant beneficial (positive) effect** | N/A |
| In-Combination Impacts (Precipitation runoff rates) | Surface water run-off will be controlled using water management techniques informed by sustainable drainage systems. The Site will be planted with native species grassland and wildflower mixes. | There is no significant risk of the solar PV modules altering precipitation runoff rates and patterns to have detrimental effects on the environment. | N/A | There is no significant risk of the Solar PV modules altering precipitation runoff rates and patterns to have detrimental effects on the environment.<br>**Not significant** | N/A |

## 8.14. References


- **Ref. 8-1**: The 2015 Paris Agreement. Available online: [redacted]
- **Ref. 8-2**: United Nations Framework Convention on Climate Change 1994. Available online: [redacted]
- **Ref. 8-3**: Kyoto Protocol 1997. Available online: [redacted]
- **Ref. 8-4**: Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available online: https://www.legislation.gov.uk/ukdsi/2019/9780111187654
- **Ref. 8-5**: Department for Energy Security and Net Zero (2023) Overarching National Policy Statement for Energy (EN-1). Available online: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1
- **Ref. 8-6**: Department for Energy Security and Net Zero (2023) National Policy Statement for Renewable Energy Infrastructure (EN-3). Available online: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3
- **Ref. 8-7**: Department for Energy Security and Net Zero (2023) National Policy Statement for Electricity Networks Infrastructure (EN-5). Available online: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5
- **Ref. 8-8**: Ministry of Housing, Communities and Local Government (2023). National Planning Policy Framework. Available online: https://www.gov.uk/government/publications/national-planning-policy-framework--2
- **Ref. 8-9:** British Energy Security Strategy (2022). Available online: https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy
- **Ref. 8-10**: HM Government (2020). Energy White Paper: Powering our Net Zero Future. Available online: https://assets.publishing.service.gov.uk/media/5fdc61e2d3bf7f3a3bdc8cbf/201216_BEIS_EWP_Command_Paper_Accessible.pdf
- **Ref 8-11:** HM Government (2023). Powering Up Britain. Available online: https://assets.publishing.service.gov.uk/media/642468ff2fa8480013ec0f39/powering-up-britain-joint-overview.pdf
- **Ref. 8-12**: North Kesteven Climate Emergency Action Plan (2024). Available online: NKDC Climate Emergency Action Plan (n-kesteven.gov.uk)

- **Ref. 8-13**: Institute of Environmental Management and Assessment (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance. Available online: [redacted]
- **Ref. 8-14**: British Standards Institute (2023) PAS 2080 - Carbon management in Infrastructure. Available online: [redacted]
- **Ref. 8-15**: Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2019) Planning Practice Guidance on Climate Change. Available online: https://www.gov.uk/guidance/climate-change
- **Ref. 8-16**: The Greenhouse Gas Protocol (2004) A Corporate Accounting and Reporting Standard. Available online: [redacted]

  **Ref. 8-17**: Royal Institution of Chartered Surveyors (2023) Whole Life. Available online: [redacted]
- **Ref. 8-18**: Building Services and Information Association, Rules of Thumb 5th Edition 2011. Available online: [redacted].
- **Ref. 8-19**: Solar Energy Industries Association. Available online: https://seia.org/
- **Ref. 8-20**: University of Bath (2019) Inventory of Carbon and Energy. Available [redacted]
- **Ref. 8-22**: Department for Energy Security and Net Zero and the Department for Business, Energy and Industrial Strategy (2024) Energy and emissions projections. Available online: https://www.gov.uk/government/collections/energy-and-emissions-projections
- **Ref. 8-23**: Department for Environment, Food and Rural Affairs (2018). Resources and waste strategy for England. Available online: https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england
- **Ref. 8-24**: UK Climate Projections (2018). Available online: https://ukclimateprojections-ui.metoffice.gov.uk/ui/home

- **Ref. 8-25**: Department for Energy Security and Net Zero (2024) Final decision letter for the Application for Development Consent for the Gate Burton Energy Park. Available online: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010131/EN010131-001744-Gate%20Burton%20Final%20Decision%20Letter.pdf

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