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# **Carbon Footprint Statement – Review of Scope 2 Emissions**

**Elsham Tech Park - Proposed Data Centre  
Development**

**Prepared for Greystoke Land Ltd.**

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# Carbon Footprint Statement

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## 1 EXECUTIVE SUMMARY

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This report, prepared by FoundDigital DS, supports North Lincolnshire Council in evaluating the environmental implications of the proposed Elsham Tech Park development, following objections concerning its potential environmental impacts. The planned campus will require up to 1 GW of power, and this assessment focuses on its Scope 2 (electricity-related) carbon emissions.

The UK already benefits from one of the cleanest electricity grids of competitor regions for AI compute investments. Within the UK, the Humber Region is a rapidly growing clean energy hub. The region contributes around 20% of national electricity generation and nearly one-third of offshore wind capacity (1). Elsham Tech Park's proximity to these energy sources reduces transmission losses, eases network congestion, improves overall system efficiency and incentivises the build out of further clean energy generation.

Quantifying electricity-related emissions in the future is inherently challenging due to the variations in electricity generation sources. Nonetheless, the decarbonisation of the National Grid will drive substantial reductions in Scope 2 emissions over the project's lifetime. This report estimates annual Scope 2 emissions peak at 1,006,478 tCO<sub>2</sub>-eq in 2035, representing 0.1% of the UK's annual Carbon Budget. This impact is classified as "Minor adverse – not significant", well below the 1% threshold considered significant.

A range of mitigation measures can further enhance the project's sustainability performance, including carbon offsetting, energy-efficient design principles, and particularly waste heat recovery. The latter represents a major opportunity, with potential carbon savings of around 825,000 tCO<sub>2</sub>-eq per year through reuse in nearby agricultural and industrial applications. The Elsham Tech Park masterplan already integrates a large-scale greenhouse and ongoing discussions with local authorities aim to expand waste heat utilisation.

At the design stage, it is recommended that the project embed low-carbon, circular-energy principles across all phases of design and delivery. Located within a rapidly growing clean energy cluster, Elsham Tech Park demonstrates how strategic siting, and sustainable design can enable world-class digital infrastructure to advance in harmony with the UK's net-zero objectives.

## 2 PREFACE

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### 2.1 Introduction

This report was prepared by FoundDigital DS to assess the potential Scope 2 emissions of the Elsham Tech Park development, located adjacent to Elsham Wolds Industrial Estate, North Lincolnshire.

Planning consultations have identified concerns regarding the development's potential environmental impact, with specific reference to the following issues: air emissions, water consumption and electricity consumption. Environmental concerns raised primarily relate to upstream emissions associated with electricity generation required to power the facility. Accordingly, the emissions linked to electricity consumption forms the principal focus of this report (or "Scope 2").

This report provides further information to assist Local Authorities in responding to the objections raised and sets out the mitigation measures that may assist in reducing any such impacts.

### 2.2 Overview of the development

Elsham Tech Park is currently undergoing the planning process with the North Lincolnshire Council (Application reference: PA/2025/643).

Within the planning application, the development is described as follows:

"Data centre park, including ancillary offices, internal plant and cooling equipment, emergency backup generators with associated fuel storage, District Heating centre, flexible commercial/amenity building(s) (Use Classes E, F1 and F2) and construction of buildings for agricultural purposes. Other works include means of access, internal roads and footpaths, cycle and car parking, hard and soft landscaping, security gatehouses and perimeter fencing, lighting, drainage, pumping station, electricity substation(s), energy generation/storage, undergrounding of overhead power lines and other associated works, infrastructure and ground remodelling including creation of landscaped bunds, with all matters reserved for subsequent consideration. Each phase of the development to be a severable component".

The development spans across a 435-acre plot area. The overall site power demand is 1 GW (including data halls, ancillary buildings and all on-site infrastructure). Full capacity will be delivered following a gradual "ramp up" approach across five years (2029 to 2034).

The waste heat generated by data centre servers while in operation is planned to be collected via heat exchangers, to be then reused both for the on-site glasshouse and for district heating. Elsham Tech Park is currently engaging with local authorities to discuss waste heat reuse for industrial and/or residential purposes.

Lincolnshire County Council's "Green Masterplan" report refers to the decarbonisation of heat networks as a key area of focus for the council to achieve UK-wide Carbon budgets (2).

In 2021, the "Opportunity areas for district heating networks in the UK" report identified Yorkshire and the Humber as having strong potential for district heating deployment (3).



Figure 1: Illustrative masterplan. Source: Elsham Tech Park – Design and Access Statement. Prepared by Pegasus Group, 2025.

## 2.3 Lincolnshire as a Data Centre Location

Northern Lincolnshire is recognised as a leading potential data centre location. In January 2025, the Government published the AI Opportunities Action Plan, outlining a strategy to support the growth of artificial intelligence and ensure its benefits are widely distributed across the UK (4). A key component of the plan is the establishment of AI Growth Zones (AIGZs), designated areas that will receive government support to accelerate the development of AI-related infrastructure (5).

In February 2025, North Lincolnshire Council, in partnership with Greystoke, submitted a proposal for the designation of the Northern Lincolnshire AI Growth Zone (NLAIGZ). The proposal highlights the area's strategic advantages, such as the approved Humber Tech Park and the proposed Elsham Tech Park (6).

### 2.3.1 The Humber is a Clean Energy Hub

Northern Lincolnshire and the wider Humber region offer notable potential as a location for data centres. The Humber accounts for approximately 20% of the UK's total electricity generation and 33% of the nation's offshore wind capacity (1), positioning it as a key contributor to the UK's clean energy transition. It also benefits from planned developments in carbon capture and storage and hydrogen production, supporting its role as a hub for low-carbon innovation. Projects include:

- **Offshore Wind farms:** the region has access to 33% of the UK's offshore wind energy. These include:

- i. Hornsea 1 (1.25 GW developed)
  - ii. Hornsea 2 (1.25 GW developed)
  - iii. Dogger Bank A (1.2 GW developed)
  - iv. Dogger Bank B (1.2 GW developed)
  - v. Hornsea 4 (2.4 GW planned) – DCO Approved
- **Carbon Capture Networks:** the planned Viking CCS and Northern Endurance Partnership, will provide access to over 60% of UK's licensed storage capacity, enabling large-scale carbon capture and sequestration.
  - i. Killingholme Low Carbon Power Utilities Project - PA/SCR/2025/898
  - ii. Viking CCS Pipeline – DCO Approved
  - iii. Humber Carbon Capture Pipeline – DCO at Pre Application Stage
- **Decarbonised thermal generation:** Over 5 grid-scale plants, of which 4.75GW is planned to connect into the carbon capture networks. These CCS ready projects include:
  - i. North Killingholme Power Project - PA/SCO/2025/7
  - ii. VPI Immingham Carbon Capture Plant - PA/2023/421
  - iii. Keadby 3 Carbon Capture Power Station – DCO Approved
  - iv. Stallingborough Combined Cycle Gas Turbine (CCGT) generating plant and Carbon Capture Plant (CCP) – DCO at Pre Application Stage
- **Hydrogen networks:** 1.22G W of generation to be connected via the proposed East Coast Hydrogen pipeline network, offering a pathway for flexible, low-carbon fuel supply.

Locating a data centre within this emerging Low-Carbon hub would provide a strategic advantage: not only could its operational emissions be mitigated through direct access to carbon capture infrastructure, but it would also align the development with the area's growing reputation as a centre for clean energy innovation and sustainable industrial growth.

### 2.3.2 Advantages of locating Data Centres Close to Sources of Power Production.

Locating energy-intensive facilities such as data centres near major power sources provides several advantages:

- **Alleviate congestion on the transmission network,** freeing capacity for other users and reducing the need for curtailment of renewable generation.

There is an ongoing nationwide issue in the UK associated with the geographical mismatch between electricity demand and generation capacity. London and the Southeast regions have growing electricity demand, driven by dense populations, major transport infrastructure, and large-scale data centres. However, these regions have more limited local generation capacity due to space constraints, high land values, and planning restrictions that make it difficult to develop new large-scale energy projects. In contrast, a large part of the UK's new renewable generation is concentrated in Scotland, northern England, and coastal areas, where there is abundant land and wind resource but comparatively lower local demand. This creates a spatial imbalance: electricity must be transmitted long distances through the national grid to reach major demand centres such as London.

The geographical mismatch between demand and generation has led to a vast increase in the grid infrastructure (pylons, cables and substations) required to facilitate all projects connecting to the transmission system, inclusive of generation and demand.

By locating the Elsham Tech Park close to large-scale generation, the project helps to minimise its impact on nationwide transmission congestion.
- **Reduce electricity transmission losses:** Locating data centres close to sources of electricity generation significantly reduces transmission losses by shortening the distance electricity must travel across the grid. Because power dissipates as heat when transmitted over long distances, situating high-demand facilities such as data centres near generation assets improves overall system efficiency.

This proximity not only lowers total system costs by reducing the amount of electricity that needs to be generated to meet demand, but also enhances grid resilience, as local generation-

consumption balancing can help mitigate congestion, voltage instability, and reliance on long-distance transmission infrastructure.

- **Aligning new demand with areas of increasing renewable generation** can support the integration of additional Low-Carbon energy projects, providing a stable local market for electricity and assisting in balancing variable supply. The presence of a data centre hub in the area means that large-scale energy developers can count on nearby customers for off-take agreements or long-term power purchase contracts. Over time, this spatial alignment between supply and demand contributes to a more resilient, decentralised, and efficient energy system, reducing the need for expensive grid upgrades, while accelerating the UK's transition to net zero.

### 2.3.2 The cost of not developing in Northern Lincolnshire

Opposing development at this site may result in the project relocating elsewhere in the UK or internationally, potentially to locations where opportunities to mitigate emissions are more limited. The current AI training powers include the United States, European Union, UAE, China and Saudi Arabia. All of these countries have more carbon intensive electricity grids, meaning the emissions from siting the development in these locations are likely to be higher.

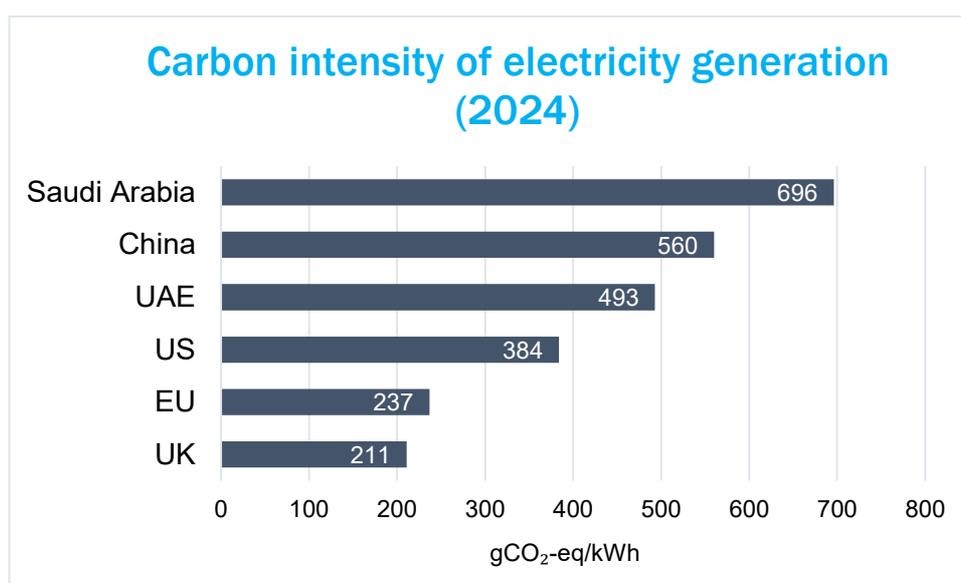


Figure 2: Carbon intensity of electricity generation for the main AI training powers. Source: Energy Institute - Statistical Review of World Energy, 2025

## 3 UK CARBON BUDGETS

Since 1990, the UK has achieved a sustained reduction in greenhouse gas emissions, cutting them by more than half as of 2024.

A major contributor to the UK's emissions reductions has been the transformation of the electricity sector. Over the past three decades, the country has phased out most coal-fired generation, replacing it with a rapidly expanding share of renewables - particularly wind and solar power - and a cleaner, more flexible gas generation fleet. This shift has not only reduced carbon intensity across the grid, but also enabled the electrification of other sectors, such as transport and heating. Continued investment in renewable generation, grid modernisation, and storage technologies will be critical to maintaining this momentum and supporting the UK's broader net zero objectives.

This marks one of the most significant emissions declines among advanced economies and reflects the cumulative impact of the Climate Change Act (2008), in which the UK Government defined a set of legally binding "Carbon budgets", with the overarching aim to reach Net-Zero by 2050. Each Carbon Budget restricts the total amount of Greenhouse Gases (GHGs) that can be emitted across the country over a 5-year period.

### 3.1 Yearly emissions budgets

Table 1 summarises Carbon allowances included as part of the Fourth, Fifth and Sixth Carbon Budgets (referring to budget periods 2023 to 2027, 2028 to 2032 and 2033 to 2037, respectively).

Budget period	Years	UK Carbon budget (tCO <sub>2</sub> -eq.)
Fourth	2023 – 2027	1,950,000,000
Fifth	2028 – 2032	1,725,000,000
Sixth	2033 - 2037	965,000,000

Table 1: UK Carbon Budgets for the years 2023 to 2037. UK Government, 2025.

### 3.2 Significance of Carbon Budget categories

Table 2 defines criteria to be used to assess the significance of Scope 2 emissions of the Elsham Tech Park development in relation to UK Carbon Budgets, previously detailed in Section 3.1.

Significance	UK Carbon Budget (t CO <sub>2</sub> -eq.)
Significant	Beneficial Net negative impact
Not Significant	Negligible <0.009%
Not Significant	Minor Adverse <0.01-0.9%

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Significant	Moderate Adverse	<1 – 9%
Significant	Major Adverse	>10%

*Table 2: In the absence of specific EIA guidelines on the significance of GHG emissions, Scope 2 emissions are assessed using EN15978:2011 (“Sustainability of construction works – Assessment of environmental performance of buildings”). Emissions that fall under 1% of the UK Carbon Budget for the reference year are defined as “Not significant”.*

The following sections conclude that the emissions associated with the development’s electricity consumption fall within the “Not significant - negligible” category during the first year of operation and “Not significant – minor adverse” during years 2030 to 2037. The report also outlines ways of further mitigating these impacts.



## 4 SCOPE 2 EMISSIONS ASSESSMENT – METHODOLOGY AND RESULTS

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### 4.1 Scope of the Assessment

Planning consultations for the Elsham Tech Park proposal have identified concerns regarding the development's potential environmental impact, with specific reference to the following issues: air emissions, water consumption and electricity consumption.

Data centre emissions primarily arise from the operation of backup generators and from refrigerant leakage from cooling systems. At this stage, it remains to be defined whether generators will be part of the backup power system to be implemented within the development. Furthermore, the proposed campus will utilise air-cooled systems, which includes small volumes of refrigerant. Modern systems incorporate leak detection and containment measures. In summary, the development's direct emissions are expected to be minor, and are not included in the assessment.

Regarding water consumption, it is expected that the development will be air-cooled (i.e., it will not utilise water-based cooling systems). As a result, the issue of large-scale water usage does not arise in this instance, and it does not form part of this study.

For all the reasons listed above, this assessment focuses on the development's energy usage while in operation. The following emissions are therefore in scope:

- **Scope 2 emissions:** emissions associated with the electricity consumption of the Data Centre and associated ancillary facilities and infrastructure during regular operations.

The following emissions are out of scope:

- **Scope 1 emissions:** emissions associated with on-site backup generators; refrigerant leakage; vehicle maintenance.
- **Scope 3 emissions:** emissions associated with the embodied carbon of materials and equipment; purchased goods and services; employee commute and business travel; data centre maintenance, repair and replacement activities; site decommissioning; waste management (7).

Previous research has shown that Scope 2 emissions are currently the most relevant across the lifecycle of a data centre (8). Scope 2 emissions are therefore the focus of this report.

### 4.2 Timeline of the Assessment

Scope 2 emissions for the development are calculated for the reference period between the Energisation Date, currently set as 29<sup>th</sup> September 2029, and 31<sup>st</sup> December 2037.

2037 was selected as the final year of the assessment as the end of the UK Carbon Budget reporting period.

This report can be further updated once post-2037 UK Carbon Budgets are announced.

## 4.3 Calculation methodology

The methodology followed to calculate the Elsham Tech Park development's Scope 2 emissions represents the best estimates based on the information currently available and is detailed below.

Sources used include the development's anticipated electricity consumption, UK government data on grid carbon intensity, and UK Government projections for the future carbon intensity of the energy sector. The methodology applied is in accordance with the GHG Protocol – A Corporate Accounting and Reporting Standard (location-based method), which is the world's most widely used greenhouse gas accounting standards and guidance.

It is important to acknowledge that providing detailed emissions figures involves inherent uncertainties, as electricity-related emissions fluctuate with the changing mix of generation sources.

### 4.3.1 Electricity consumption

Table 3 summarises the estimated electricity consumption for the reference period 2029-2037.

The yearly electricity consumption for the Elsham Tech Park campus is calculated by multiplying data centre power capacity in MW by the estimated number of hours of operation during the reference year.

A gradual power-ramp up of 200 MW per year over 5 years was assumed.

It was also assumed that the site will rely on backup power supply due to outages and/or maintenance activities for up to 12 hours per calendar year.

Year of operation	Power Capacity (MW)	Electricity use per year (hours)	Total yearly electricity consumption (MWh)
2029	200	2256	451,200.00
2030	400	8760	3,504,000.00
2031	600	8760	5,256,000.00
2032	800	8760	7,008,000.00
2033	1000	8760	8,760,000.00
2034	1000	8760	8,760,000.00
2035	1000	8760	8,760,000.00
2036	1000	8760	8,760,000.00
2037	1000	8760	8,760,000.00
<b>Total electricity consumption (MWh, 2029 to 2037)</b>			<b>60,019,200.00</b>

Table 3: The estimated yearly electricity consumption of the Elsham Tech Park development across the years 2029-2037. Peak load is reached following a phased approach across five years.

## 4.3.2 Scope 2 emissions

Table 4 outlines the projected Scope 2 emissions associated with Elsham Tech Park’s electricity consumption throughout the reference period 2029-2037.

The UK Government reports yearly on the carbon intensity of the UK transmission system. In 2025, the UK Grid Carbon Conversion factor was 0.177 kgCO<sub>2</sub>/kWh (9).

In December 2024, the UK government also published the “Energy and emissions projections 2023 to 2050” report. Government projections show that the energy sector is increasingly decarbonised (10).

The 2025 UK Grid carbon factor of 0.177 kgCO<sub>2</sub>/kWh was scaled in proportion with UK-wide emission projections for the energy sector to obtain the estimated Grid Carbon Conversion factors for years 2029 to 2037, as shown in Table 4.

Yearly Scope 2 emissions were calculated by multiplying the annual electricity consumption (previously detailed in section 3.3.1) by the estimated Grid Carbon Conversion factor for the reference year.

Year of operation	Yearly electricity consumption (MWh)	Carbon conversion factor – grid electricity (kgCO <sub>2</sub> /kWh)	Yearly Scope 2 emissions (kgCO <sub>2</sub> /year)
2029	451,200.00	0.143	64,450,357.89
2030	3,504,000.00	0.127	446,114,526.32
2031	5,256,000.00	0.115	603,886,736.84
2032	7,008,000.00	0.115	805,182,315.79
2033	8,760,000.00	0.115	1,006,477,894.74
2034	8,760,000.00	0.115	1,006,477,894.74
2035	8,760,000.00	0.118	1,033,680,000.00
2036	8,760,000.00	0.115	1,006,477,894.74
2037	8,760,000.00	0.112	979,275,789.47
<b>Total Scope 2 emissions (kgCO<sub>2</sub>, 2029 - 2037)</b>			<b>6,952,023,410.53</b>

Table 4: Yearly Scope 2 emissions associated with Elsham Tech Park’s electricity consumption. Carbon conversion factors are based on UK Government projections for the carbon intensity of the energy sector.

## 5 SCOPE 2 EMISSIONS ASSESSMENT – DISCUSSION

### 5.1 Significance in relation to UK Carbon Budgets

Year of operation	Yearly carbon budget (tCO <sub>2</sub> -eq.)	Yearly Scope 2 emissions (tCO <sub>2</sub> -eq.)	Percentage of carbon budget (%)	Significance of Impacts
2029	1,725,000,000.000	64,450.358	0.0037	Not significant - Negligible
2030	1,725,000,000.000	446,114.526	0.0259	Not significant – Minor adverse
2031	1,725,000,000.000	603,886.737	0.0350	Not significant – Minor adverse
2032	1,725,000,000.000	805,182.316	0.0467	Not significant – Minor adverse
2033	965,000,000.000	1,006,477.895	0.1043	Not significant – Minor adverse
2034	965,000,000.000	1,006,477.895	0.1043	Not significant – Minor adverse
2035	965,000,000.000	1,033,680.000	0.1071	Not significant – Minor adverse
2036	965,000,000.000	1,006,477.895	0.1043	Not significant – Minor adverse
2037	965,000,000.000	979,275.789	0.1015	Not significant – Minor adverse

Table 5: Significance of the development's Scope 2 emissions in relation to UK Carbon budgets.

The potential Scope 2 emissions associated with the development's operational electricity usage between years 2029 and 2037 was found to be **6,952,023.411 tCO<sub>2</sub>-eq.**

Table 5 shows the estimated yearly emissions in relation with National Carbon Budgets for the same year. With reference to the "Significance levels" previously outlined in Table 2, estimates indicate that the Scope 2 emissions associated with the development's electricity consumption fall within the "**Not significant - negligible**" category during the first year of operation (accounting for 0.0038% of the yearly budget) and "**Not significant – minor adverse**" during years 2030 to 2037 (accounting for 0.026-0.107% of the yearly budget).

## 5.2 Proposed mitigation measures

A set of measures are proposed below to either reduce the Elsham Tech Park's Scope 2 emissions, or support in reducing Greenhouse Gas emissions for the North Lincolnshire community.

Planning conditions can be used to ensure the implementation of mitigation measures.

### 5.2.1 Proposed Strategies to Mitigate the Development's Scope 2 emissions

This section outlines measures aimed at mitigating the development's Scope 2 emissions. These are mainly focused on: minimising electricity consumption, accessing a fully renewable power supply, and the capture and storage of residual emissions.

#### 5.2.1.1 Reducing energy consumption

Reducing electricity consumption to the maximum extent directly reduces Scope 2 emissions. This can be achieved in several ways.

- **Demand Side Response:** DSR mechanisms are used to manage Data Centres power demand and reduce the electricity consumption of non-critical loads. DSR mechanisms temporarily reduce or shift energy use by modulating flexible systems, such as cooling, during periods of grid stress or frequency deviations. These short-term reductions support real-time grid balancing without impacting critical operations, enabling improved system stability and facilitating integration of variable renewable generation.
- **Procuring High-efficiency IT equipment:** Servers, storage, and networking equipment with low power usage effectiveness (PUE) support in minimising energy consumption.
- **Implementing Energy-Efficient Cooling Systems:** Free cooling reduces reliance on energy-intensive mechanical cooling.
- **Modular Design:** Adopting a scalable infrastructure approach prevents overprovisioning, thereby minimising energy wasted by idle systems. The development can be expanded through a phased approach, following the gradual power ramp-up, until peak load is reached.
- **Building Energy Management Systems (BEMS):** Implementing continuous monitoring and optimisation of energy use enhances operational efficiency.
- **Scalar Advantages:** Large-scale data centres are more efficient than smaller ones because they can optimise energy use through advanced cooling systems, higher server utilisation, and economies of scale in power and equipment management. Their larger infrastructure allows for improved load balancing, and lower energy use per unit of computing output.

### 5.2.2 Carbon Neutral Data Centre Pact

Elsham Tech Park will commit to the Climate Neutral Data Centre Pact.

Signatories of the Climate Neutral Data Center Pact (CNDCP) are required to align their electricity consumption with clean energy sources. By December 31, 2030, 100% of data centre electricity demand must be met with renewable energy or Carbon-Free energy on an hourly basis.

Pact operators include AWS, Google, Microsoft, Meta and Digital Realty.

### 5.2.3 Proposed strategies to mitigate local industries' Greenhouse Gas emissions: Waste heat reuse

This section details how the Elsham Tech Park development can contribute to reducing Greenhouse Gas emissions for the North Lincolnshire community.

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Data centre servers release large amounts of waste heat while in operation. The Data Centre's waste heat can be collected via on-site heat exchangers and shared with local users. Reusing data centre waste heat avoids the combustion of additional fuel for heating, therefore preventing further emissions across other industry sectors. The masterplan includes for a substantial glasshouse to make use of waste heat and other applications currently being discussed include local industrial facilities.

Greenhouses typically burn natural gas to provide heat in commercial greenhouses. The avoided potential greenhouse emissions associated with waste heat reuse from the Elsham development instead of natural gas are shown in Table 6 below. It is assumed that 50% of heat generated yearly is potentially reusable.

Year of operation	Power capacity (MW)	Reusable waste heat generated yearly (MWh)	Corresponding volume of natural gas saved (m <sup>3</sup> )	Avoided Greenhouse Gas emissions yearly (kgCO <sub>2</sub> -eq.)
2029	200	225,600.00	20,559,367.91	42,490,456.84
2030	400	1,752,000.00	159,663,176.31	329,979,079.75
2031	600	2,628,000.00	239,494,764.47	494,968,619.62
2032	800	3,504,000.00	319,326,352.63	659,958,159.50
2033	1000	4,380,000.00	399,157,940.78	824,947,699.37
2034	1000	4,380,000.00	399,157,940.78	824,947,699.37
2035	1000	4,380,000.00	399,157,940.78	824,947,699.37
2036	1000	4,380,000.00	399,157,940.78	824,947,699.37
2037	1000	4,380,000.00	399,157,940.78	824,947,699.37
<b>Total avoided Greenhouse Gas emissions over the reference period 2029 - 2037 (kgCO<sub>2</sub>-eq.)</b>				<b>5,652,134,812.59</b>

Table 6: Estimated yearly Greenhouse Gas emission savings associated with reusing the waste heat generated by the Elsham Tech Park Data Centre Campus while in operation. It was assumed that the waste heat is used to replace natural gas for heating.

## 6 CONCLUSION

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### 6.1 Summary and Conclusion

It is important to acknowledge that providing detailed emissions figures involves inherent uncertainties, as electricity-related emissions fluctuate with the changing mix of generation sources supplying the grid. Using the best information currently available, this report has estimated the potential Scope 2 emissions associated with the operational electricity consumption of the Elsham Tech Park data centre campus. The development is projected to have a 1 GW power demand, supplied through the UK National Grid, with an annual electricity consumption of approximately 8,760,000 MWh at full capacity. Maximum operational load is expected to be reached within five years from initial energisation, and Scope 2 emissions have been calculated based on this gradual power ramp-up profile, as outlined in Table 4.

In 2024, the UK grid's carbon intensity was 0.211 kgCO<sub>2</sub>/kWh, below the European average of 0.237 kgCO<sub>2</sub>/kWh (11) and significantly lower than all major non-European competitor locations. According to UK Government projections, grid decarbonisation will continue, with carbon intensity expected to decline further by the time the data centre becomes operational in 2029, reaching a low point around 2031. Relative to national carbon budgets, the first year of operation represents approximately 0.0038% of the UK's carbon allowance for 2029, while subsequent years (2030–2037) account for 0.026–0.102% of annual budgets. These levels fall well below the 1% significance threshold and are therefore classified as “not significant.”

There are, moreover, opportunities to mitigate this impact through efficient design, carbon offsetting via the Carbon Neutral Data Centre Pact, and the reuse of waste heat for local applications such as agriculture, industry, and district heating. The Humber region provides an ideal context for this development, supplying around 20% of the UK's total electricity generation and over one-+ of its offshore wind capacity (1), alongside major investments in carbon capture and storage (CCS), hydrogen production, and low-carbon thermal generation. Locating the data centre within this clean-energy cluster will minimise transmission losses, enhance grid resilience, and align new demand with nearby renewable generation.

In conclusion, the Scope 2 emissions associated with the Elsham Tech Park are not significant in relation to UK Carbon Budgets and will continue to decline as the grid decarbonises. Through waste heat recovery and integration with the region's low-carbon energy infrastructure, the development will contribute to local decarbonisation while supporting the UK's broader AI growth and Net Zero ambitions while bringing economic benefits to North Lincolnshire and the wider Humber region.

## 7 REFERENCES

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### 7.1 References

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