



High Speed Rail (West Midlands - Crewe)

Environmental Statement

Volume 5: Technical appendices

Climate

Summary greenhouse gas calculation outputs (CL-003-000)



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Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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A report prepared for High Speed Two (HS2) Limited:

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1 Introduction

1.1.1 The climate change Appendices comprise of three documents:

- Appendix CL-001-000 – Climate data and information;
- Appendix CL-002-000 – Results of climate change assessments; and
- Appendix CL-003-000 – Summary greenhouse gas calculation outputs.

1.1.2 This Appendix provides a summary of the greenhouse gas assessment results; it should be read alongside the High Speed Rail (West Midlands - Crewe) Environmental Statement (ES): Volume 3, Route-wide effects.

1.1.3 It should be noted that the figures in the following tables have been rounded. Totals are calculated from the un-rounded data and therefore may not appear to be the sum of the component parts.

2 Results

2.1 Overall results

2.1.1 Table 1 presents the Proposed Scheme's overall carbon emissions, from construction and 120 year operational period, by life cycle stage.

Table 1: The Proposed Scheme's total carbon emissions by life cycle stage

| Life cycle stage | Module | Description | tCO ₂ e |
|---|--------|---|--------------------|
| Before use stage | A1 | Product manufacturing | 666,000 |
| | A2 | | |
| | A3 | | |
| | A4 | Transport of construction material to work site | 171,000 |
| | A5 | Construction/ installation process | 533,000 |
| Use stage | B1 | Carbon sequestration from tree planting | -174,000 |
| | B4 | Replacement of infrastructure | 224,000 |
| | B6 | Operation of infrastructure | 15,000 |
| | B9 | Operation of rolling stock | 250,000 |
| Benefits and loads associated with mode shift | D | Passenger mode shift | -364,000 |
| | | Freight mode shift | -55,000 |
| | | Surface access journeys to access HS2 | 112,000 |
| Total residual carbon emissions | | | 1,378,000 |

2.2 Before use stage results (A1-A5)

2.2.1 Table 2 presents the construction product manufacturing stage (A1-A3) carbon emissions results.

2.2.2 Carbon emissions associated with the transport of materials to work site (A4) are as reported in Table 1.

2.2.3 Carbon emissions associated with construction and installations processes (A5) such as plant equipment use and temporary works are presented in Table 3.

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Table 2: The Proposed Scheme's product stage (A1-A3) carbon emissions breakdown

| Element category | tCO₂e | % |
|---------------------------|-------------------------|-------------|
| Track | 200,000 | 28% |
| Viaducts | 173,000 | 24% |
| Bridges | 89,000 | 13% |
| Tunnels | 58,000 | 8% |
| Retaining walls | 37,000 | 5% |
| Misc. buildings and works | 35,000 | 5% |
| Road Adjustments | 16,000 | 2% |
| Stone IMB-R | 14,000 | 2% |
| Auto-transformer Stations | 14,000 | 2% |
| Utilities Adjustments | 10,000 | 1% |
| Embankments | 8,000 | 1% |
| Cuttings | 7,000 | 1% |
| Drainage | 3,000 | < 1% |
| Footpath adjustments | 2,000 | < 1% |
| Watercourse diversions | - | < 1% |
| Total | 666,000 | 100% |

Table 3: The Proposed Scheme's construction process stage (A5) carbon emissions

| Element category | tCO₂e | % |
|--|-------------------------|-------------|
| Land use change | 378,000 | 71% |
| Transport of excavated material | 79,000 | 15% |
| Temporary works | 41,000 | 8% |
| Construction plant | 28,000 | 5% |
| Construction and demolition waste transport and disposal | 7,000 | 1% |
| Total | 533,000 | 100% |

2.3 Use stage results (B1-B9)

2.3.1 Table 4 summarises the use stage (operational) carbon emissions of the Proposed Scheme.

Table 4: Use stage (B1-B9) carbon emissions breakdown

| Element category | tCO ₂ e |
|--|--------------------|
| Carbon sequestration from tree planting (B1) | -174,000 |
| Replacement of infrastructure (B4) | 224,000 |
| Operation of infrastructure (B6) | 15,000 |
| Operation of rolling stock (B9) | 250,000 |
| Total | 315,000 |

2.4 Benefits and loads beyond the project boundary (D)

2.4.1 Table 5 presents the carbon emissions results from passenger and freight mode shift as well as surface access journeys.

Table 5: Benefits and loads associated with mode shift carbon emissions breakdown

| Element category | tCO ₂ e |
|-------------------------|--------------------|
| Passenger mode shift | -364,000 |
| Freight mode shift | -55,000 |
| Surface access journeys | 112,000 |
| Total | -307,000 |

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