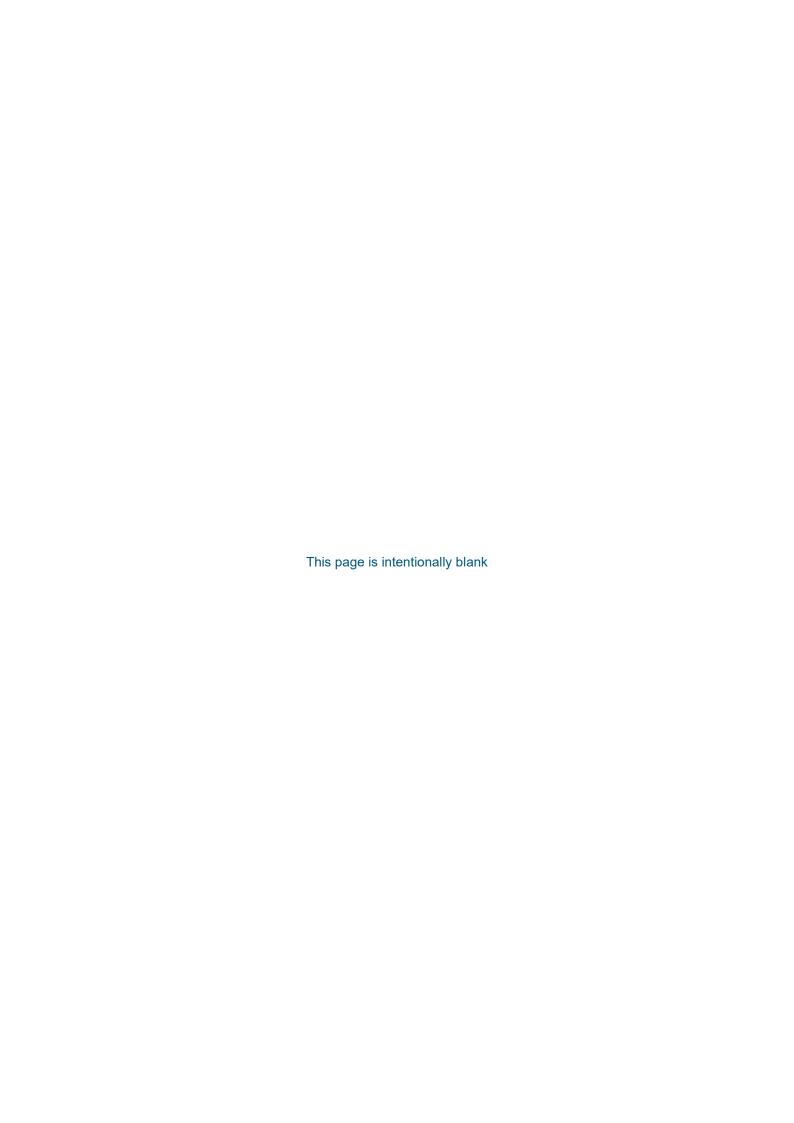


## Technical Appendix 18.1 Embodied Emissions in Materials

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## **Appendix 18.1 Embodied Emissions in Materials**

1. The emission factors used in the GHG assessment for embodied emissions in materials are presented in **Table 18.17**.

Table 18.17 Emission Factors for Embodied GHG in Materials

| Material   | Emission Factor (kgCO₂e.kg⁻¹,<br>unless otherwise stated) | Source  | Notes  |
|--|---|---|--|
| Cement and mortar: Cement                                      | 0.83211   | ICE Database V3.0 November 2019 (Jones & Hammond, 2019) | General (UK average)   |
| Cement and mortar: Grout                                       | 0.62  |   | Cement; Grout  |
| Concrete   | 0.10336   |   | General concrete   |
| Steel (average)  | 2.47  |   | Average of embodied CO <sub>2</sub> e steel values provided in ICE Database                  |
| Stone/Gravel   | 0.079   |   | Stone (general)  |
| Glass reinforced plastic (GRP) - Fibreglass (Fibreglass Proxy) | 8.1   |   | CO <sub>2</sub> only   |
| Aggregate: clay (Bentonite proxy)                              | 0.39321   |   | Assumed clay to be representative of bentonite, as bentonite is "an absorbent swelling clay" |
| Aluminium  | 6.67  |   |  |
| Copper (Cu) (cables)   | 2.71  | Cableizer (2021)  |  |
| XLPE (cables)  | 1.93  |   |  |
| Semiconductor (cables – proxy) (paper)                         | 1.49  |   |  |
| PE sheath (cables)   | 2.54  |   |  |
| Lead (Pb) (cables)   | 1.67  |   |  |
| Armouring (cables)   | 1.46  |   |  |
| PP yarn (cables)   | 3.69  |   | CO <sub>2</sub> only   |
| PE filler (cables)   | 2.54  |   |  |
| Bearing grease   | 1.40  | BEIS Conversion Factors<br>(2021)                       | Mineral oil (assumed)  |
| Transformer (ester oil)  | 1.40  |   | Mineral oil (assumed)  |
| Cooling (water/glycol)   | 1.40  |   | Mineral oil (assumed)  |
| Hydraulic oil  | 1.40  |   | Mineral oil (assumed)  |
| Pitch gearbox oil  | 1.40  |   | Mineral oil (assumed)  |
| Gearbox oil (gear oil)   | 1.40  |   | Mineral oil (assumed)  |
| SF <sub>6</sub> Gas  | 9.00  | Campbell and McCulloch, 1998                            | SF <sub>6</sub>  |





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