



Technical Appendix 18.1

Embodied Emissions in Materials

Offshore EIA Report: Volume 2

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Appendix 18.1 Embodied Emissions in Materials

- 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 (kgCO ₂ e.kg ⁻¹ , 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 ₂ e steel values provided in ICE Database
Stone/Gravel	0.079		Stone (general)
Glass reinforced plastic (GRP) - Fibreglass (Fibreglass Proxy)	8.1		CO ₂ only
Aggregate: clay (Bentonite proxy)	0.39321		Assumed clay to be representative of bentonite, as bentonite is "an absorbent swelling clay"
Aluminium	6.67	Cableizer (2021)	
Copper (Cu) (cables)	2.71		
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 ₂ only
PE filler (cables)	2.54		
Bearing grease	1.40		BEIS Conversion Factors (2021)
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 ₆ Gas	9.00	Campbell and McCulloch, 1998	SF ₆



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