GREEN VOLT

Technical Appendix 18.1

Embodied Emissions in Materials

Offshore EIA Report: Volume 2

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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 ($kgCO_2e.kg^{-1}$, 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_2e 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		
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_2 only
PE filler (cables)	2.54		
Bearing grease	1.40	BEIS Conversion Factors (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_6 Gas	9.00	Campbell and McCulloch, 1998	SF_6

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