



**Castle Cement Limited**

# **Carbon Capture and Storage Project – Padeswood North Wales**

Volume 4, Draft Technical Appendix 7.1

**Climate Technical Appendix**

**RSK**

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# 7 CLIMATE – TECHNICAL APPENDIX

## 7.1 Introduction

7.1.1 This Technical Appendix of the draft Environmental Statement Climate Chapter (as provided in **Volume 2, Chapter 7: Climate**) reports the raw data and emissions factors used to carry out the Greenhouse Gas (GHG) assessment. This Technical Appendix is intended to be read as part of the wider draft Environmental Statement Climate Chapter, which includes the methodology and assumptions used within the assessment.

7.1.2 Emissions calculations apply the following format:

$$\text{Activity data} \times \text{emissions factor} = \text{emissions in mass of CO}_2\text{e}$$

## 7.2 Baseline scenario

7.2.1 **Table 7.1** presents the activity and emissions factors used for the baseline GHG emissions assessment.

**Table 7.1 Activity data and emissions factors used for the estimation of GHG emissions from the baseline scenario**

Data type	Value	Unit	Source
Clinker production	817	ktpa	Supplied by the Applicant
Emissions from clinker production	442.7	kgCO <sub>2</sub> /tonne clinker	Supplied by the Applicant
Coal consumption	33,362.8	tonnes/yr	Supplied by the Applicant
Emissions from coal consumption	2,396.48	kgCO <sub>2</sub> e/tonne	DESNZ, 2023
Solid Recovered Fuel consumption	1,418,253.8	GJ	Supplied by the Applicant
Emissions from Solid Recovered Fuel consumption	89.8	kgCO <sub>2</sub> /GJ	Supplied by the Applicant

Data type	Value	Unit	Source
Biomass consumption	763,675.1	GJ	Supplied by the Applicant
Emissions from biomass consumption	89.8	kgCO <sub>2</sub> /GJ	Supplied by the Applicant

## 7.3 Construction of Proposed Development

7.3.1 A large number of data sources have been supplied by the Applicant to estimate emissions from construction. These are summarised at a high-level in **Table 7.2**. For material quantities supplied as part of ‘abnormal indivisible loads’ and ‘large loads’, the majority of items were estimated to weigh between 25-30t per load, and made up of structural steel.

**Table 7.2 A summary of key activity data and emissions factors used for the estimation of GHG emissions from the construction of the Proposed Development**

Material	Quantity (t)	Emissions factor	Unit	Source
Building Steel	200	2.73	kgCO <sub>2</sub> e/kg	ICE, 2019
Structural Steel	6,000	2.73	kgCO <sub>2</sub> e/kg	ICE, 2019
Piling	8,400	238	kgCO <sub>2</sub> e/m <sup>3</sup>	BRE, 2018
Sheet Piling	1,060	2.73	kgCO <sub>2</sub> e/kg	ICE, 2019
General Concrete Pours	50,400	238	kgCO <sub>2</sub> e/m <sup>3</sup>	BRE, 2018
Holding Pond concrete	3,444	213	kgCO <sub>2</sub> e/m <sup>3</sup>	BRE, 2018
Reinforcing steel	2,244	1.99	kgCO <sub>2</sub> e/kg	ICE, 2019
Pipework	2,500	3.02	kgCO <sub>2</sub> e/kg	ICE, 2019
Cable tray	2,355	3.21	kgCO <sub>2</sub> e/kg	EPD, 2021
Electrical (Cable)	696	53,500	kgCO <sub>2</sub> e/km	The International EPD System, 2021
Fencing	120	2.72	kgCO <sub>2</sub> e/kg	BRE, 2022
Imported Stone	86,272	OneClickLCA 2018 <sup>1</sup>	kgCO <sub>2</sub> e/kg	OneClickLCA, 2018
Piling mat	4,800	OneClickLCA 2018	kgCO <sub>2</sub> e/kg	OneClickLCA, 2018
Asphalt	16,742	OneClickLCA 2023	kgCO <sub>2</sub> e/kg	OneClickLCA, 2023
Concrete Pavement	7,611	238	kgCO <sub>2</sub> e/m <sup>3</sup>	BRE, 2018

<sup>1</sup> Unable to share due to contractual obligations.

## 7.4 Operation of Proposed Development

7.4.1 Emissions from the operation of the Proposed Development utilises the data presented in **Table 7.1** and **Table 7.3**.

**Table 7.3: Activity data and emissions factors used for the estimation of GHG emissions from the operation of the Proposed Development**

Data type	Value	Unit	Source
Natural gas consumption	764,963	MWh/year	Supplied by the Applicant
Emissions from natural gas consumption	182.929	kgCO <sub>2</sub> e/MWh	DESNZ, 2023
Upstream emissions from natural gas (WTT)	30.2	kgCO <sub>2</sub> e/MWh	DESNZ, 2023
Amine solvent use	96	tonnes/yr	Supplied by the applicant
Embodied emissions from amine solvent (alamine applied as a proxy)	1300	kgCO <sub>2</sub> e/tonne	Mortimer et al., 2009
Sodium hydroxide use	79.4	tonnes/yr	Supplied by the applicant
Embodied emissions from sodium hydroxide	1400	kgCO <sub>2</sub> e/tonne	Mortimer et al., 2009

## 7.5 Decommissioning of Proposed Development

7.5.1 Emissions from the decommissioning of the Proposed Development utilises emission factors sourced from OneClick LCA. Due to contractual obligations it is not possible to share this data, however the main decommissioning assumptions have been included within **Volume 2, Chapter 7: Climate**.

## 7.6 References

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