

Type II Declaration of Carbon Footprint of Operations

Document to support the calculations made in the Entropy System for Carbon monitoring

An explanation of the Type II declaration of embodied carbon dioxide measurement for business units across Aggregate Industries

Rev 1: 20 September 2010

Rev 2: 24 February 2011

Rev 3: 18 May 2011

Declaration

I have reviewed this document and believe that it follows the guidance found in ISO 14021 and ISO 14020. The evaluation methods are clear, transparent and scientifically sound. The sources of data and conversion factors are from reputable sources which are readily available. Those who seek this information can be assured of the validity of the claims made.

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Disclaimer: Whilst every effort has been made to ensure that any data released is as accurate as possible Aggregate Industries will not be liable for any extension of this data into other studies and assessments. The calculation procedure is for embodied carbon dioxide only and is meant to inform and guide users of the information as part of a multi criteria decision making process. It is not intended for the information to be used for comparative purposes especially between different manufacturers as the methodology and assumptions will differ

Scope

This document is provided to provide clarity to those who seek and receive embodied Carbon Dioxide (carbon footprint) numbers from Aggregate Industries; such data is (at the time of writing) based on the operational unit and is expressed as kg of CO₂/tonne of product/m³ of readymix concrete. The information provided is based on data for the previous full year's production at the particular operation e.g. a request for the carbon footprint for the range of products from a particular quarry in October 2010 would be based on energy consumption and tonnage figures for the whole of 2009. The conversion factors contained within the calculation are for Carbon Dioxide only and not Carbon Dioxide equivalents.

Boundary Definition

The calculation considers the impacts of processing the raw material once it enters the processing plant to the point where the finished materials are produced. The boundary is therefore the physical plant i.e. the start of the crushing process in a quarry to the production of graded aggregates. As the boundary is limited to the production facility impacts arising from the use of explosives at first extraction are not included but internal transportation around units is included; similarly the embodied carbon dioxide is not included from one operation to another i.e. the embodied carbon dioxide of graded aggregates is not included in the calculation to manufacture concrete. However, the pre-combustion CO₂, which is generated during refining and processing of fuels, is included in accordance with DEFRA guidance. The purpose of carbon footprinting at Aggregate Industries is primarily an internal benchmarking mechanism to reduce the process impacts; further options are available for some product streams that have a 'cradle to gate' life cycle as apposed to a 'gate to gate' approach.

Calculation Procedure

The inputs are related to the oils and fuels used for vehicles involved in the production process. The electricity, liquid fuels and natural gas used in production processes are included. All carbon dioxide factors are freely available from DEFRA and specific calorific factors have been provided from individual fuel/oil suppliers. The calculation takes place in the company integrated management system BSI Entropy. The recent pre-combustion factors from DEFRA have been used and our calculations revised accordingly.

Allocation

The issue of allocation often arises when calculating carbon footprints. The numbers provided are for an operational unit for the entire range of materials it provided in the previous calendar year. Whilst it is appreciated that this does not reflect the embodied

carbon for a single product line e.g. 10mm Single sized aggregate, a generic is perhaps more meaningful to customers choosing a particular location as material grade is often specified. The potential confusion that could be caused by allocating the generic carbon footprint to the breadth of materials produced by either volume or economic value could be very subjective and reduce the scientific rigour and transparency recommended by the ISO standard on Environmental Product Declarations.

Further Assistance

This short document is aimed to support and inform customers about the generic carbon footprints available from Aggregate Industries. For further information please contact Shamir Ghumra (shamir.ghumra@aggregate.com) on 01530 816600.