Developers, architects and clients can now easily compare a planned building's CO_2 footprint

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The Edinburgh Centre for Carbon Management (ECCM) has developed a free and easy-to-use Building Materials Carbon Calculator, which will analyse the embodied CO_2 in the materials used in a building. The tool is the first of its kind and will be a valuable aid to the construction industry as it works towards a zero-carbon future.

Richard Tipper, Director at ECCM explained why his organisation developed the software:

"We receive lots of enquiries from the construction industry, all wanting to understand and analyse the CO_2 emissions of the materials used in building - the building's material footprint. So we developed a tool that allows users to type in the quantities for the materials used in each element of a building and then assess the associated CO_2 using scientifically backed emissions data. It's a simple to use and understand tool designed to clear the haze surrounding calculating a building's materials footprint."

For example, a two-bedroom semi-detached house might use concrete in its foundations, along with hardcore, concrete slab, screed and extruded polystyrene in its flooring and wooden joists in the roof. The Carbon Calculator will provide a reading of the embodied CO_2 in each of the building elements.

In this example, the foundations and floor would be responsible for releasing 2.9 tonnes of CO_2 into the atmosphere during production, delivery and installation. On the other hand, the timber joists actually absorb and so remove 0.1 tonnes of carbon dioxide. Timber is recognised as being 'carbon negative' because it captures and stores more CO_2 as it grows than is used in harvesting, processing and delivery. Once quantities for all the project's elements have been inputted, an overall indication of the building's carbon footprint is provided. In this case which uses a combination of timber frame and block work, the materials used to build a two-bed semi-detached house would produce12.2 tonnes of CO_2.

The software also encourages users to reconsider and compare the materials they select in order to reduce a building's carbon footprint, perhaps down to zero. In the above example, replacing the brickwork and glass wool used in the external walls with timber cladding over a panelvent board and cellulose wool insulation alone saves five tonnes of CO_2. When combined with other, 'low carbon materials', the overall CO_2 output can be reduced to as little as 3.1 tonnes – a saving of over nine tonnes per building.

The Building Material Carbon Calculator will help clients, architects, builders and developers gain a clearer understanding of the environmental impact of their projects at the concept stage. It also encourages comparison with alternative materials to lower the total CO_2 emissions of a building's material's footprint.

For each type of material the tool use the best available evidence. All the data used in calculations are referenced for verification purposes.

As housebuilders' prepare for the 2016 target of zero carbon homes, which among other things, target's a buildings energy whilst in use, verifiable, independent tools and guidance provided by the Carbon Calculator will become increasingly important. It helps decision makers select the best material to use in order to minimise a building's overall carbon footprint.

Willmott Dixon, which has worked with White Design on the recently unveiled Re-Thinking School at Offsite07, is one such developer. Working with White Design, it aimed to produce a low carbon, sustainable learning environment for pupils. Craig White, Director at White Design, used the Building Materials Carbon Calculator to assess the project's footprint:

"A low embodied CO2 footprint was one of the main drivers for the project which led the design and specification choices we made. The Carbon Calculator shows that overall, the project was actually carbon negative – unheard of in most modern school building – thanks to careful materials selection and design. We're very proud of the 40.9 tonnes of CO2 saved from emission to the atmosphere during the material's lives from cradle to site."

Craig adds, "This delays the date on which emissions from the non renewable energy use of the project begins to form a carbon footprint."

The free software, which comes in the form of a Microsoft Excel spreadsheet, can be downloaded from:
http://www.eccm.uk.com/

Ends

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Notes to editors:

- The building elements compared within the tool are: foundations, external walls, roof, cladding, floors, insulation, internal walls, windows and doors
- ECCM is the UK's leading carbon management research centre. It has been independently researching the impact of carbon on the environment for nearly a decade