BECD entity-level section

Consultation phase 1

Briefing document

Introduction

The Built Environment Carbon Database is an initiative led by a consortium of UK professional bodies and organisations: BRE, CIBSE, CIC, CIOB, ICE, IStructE, RIBA, RICS, the Carbon Trust and UK GBC. Its objective is to align reporting practices and bring together existing data in a single location which is free to access, easy to use, and can act as the main UK platform to store carbon assessments and generate carbon benchmarks. For more information about BECD and its supporters please visit www.becd.co.uk

This document provides information relevant to the first phase of the industry consultation on the entity-level section of BECD, i.e. the database part that will host whole-life carbon data for entire buildings and infrastructure assets (called "entities"). This section of BECD is designed to align with current carbon assessment and reporting practices of the British industry, thus it will host data only for entities located in the UK. However, users will be able to generate a report of carbon emissions in accordance with the international ICMS3 format. BECD will also contain of a separate section for LCA data of construction products (EPDs and other LCA sources), but this is outside the scope of this consultation. Please see our white paper for more details.

This first phase of consultation presents the data structure of the entity-level section, i.e. the type of information accepted by the database and its organisation. The draft data structure has been prepared by a group of built environment professionals (Work Group 1) appointed by the Steering Group of BECD. Software development on the basis of this draft data structure has already started, thanks to the support of BCIS. As this development progresses, WG1 is keen to engage with the industry to ensure the entity-level section is fit-for-purpose and aligned with professional practice. The consultation process is planned as follows:

- Phase 1 - Data structure (opening 16 May 2022, closing 24 June 2022, feedback will be processed before the next phase)
- Phase 2 – Interface: the online database will be available as a pilot, users will be able to test the manual input mode and the entity management dashboard (August 2022)
- Phase 3 – Main functions and outputs: the database will be populated with existing datasets, and users will be able to test the main functionalities (October 2022)
- Phase 4 – Software interoperability, and infrastructure assets: we will provide information on the APIs for import of entity data and export of database results, users will be able to test the modified data structure for infrastructure entities (December 2022)

Data structure overview

The draft data structure is presented in two mock-up spreadsheets with explanatory notes, available here. The first spreadsheet shows an empty data structure, while the second one shows the same structure completed with values for a fictional example.

Entity-level data is organised through a) entities and b) "project stages". An entity is a building or infrastructure asset for which one or more carbon assessments are conducted. Each entity is

associated with metadata to describe its main features, such as typology (residential, office, etc.), location, and project type (new build, retrofit, etc.). The "owner" of an entity (i.e. the user who creates the entity) can associate up to 8 project stages to it. The 8 project stages are aligned with the RIBA Plan of Work 2020, and each is meant to correspond to a different carbon assessment. Thus up to 8 assessments can be reported for the same entity as the project progresses from Strategic Definition (stage 0) to Use (stage 7). This allows tracking how carbon emissions (and other relevant information) change as an entity becomes more defined, as well as comparing emissions of different entities at similar levels of project development. The following diagram shows an example of an entity that has been associated with three project stages. The term "project" is used to indicate the totality of the data associated with one entity.
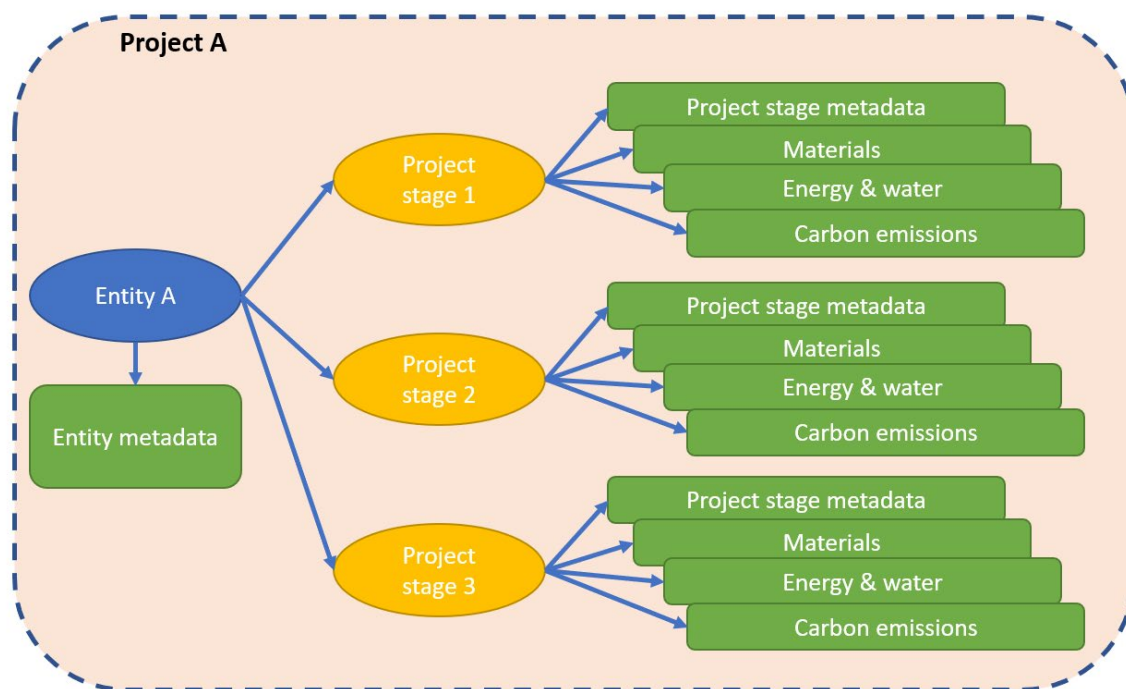
All the data contained in a project stage is held as a draft by the BECD system until the owner decides to "publish" that project stage. At that point, the project stage becomes part of the pool of datasets that can be searched by other users, and its data cannot be edited by the owner unless a direct request is made to the database administrators.

For details of the data structure, please see the mock-up spreadsheets mentioned above. Once you have familiarised yourself with the structure, we invite you to **provide us with your comments through this online questionnaire**: https://survey.zohopublic.eu/zs/RBDH6w . Please note that the current data structure has been created to reflect carbon assessment practice of buildings rather than infrastructure assets, and the questionnaire asks explicitly what should be modified to make it suitable for infrastructure assessment. Once established, the BECD system will automatically select the relevant data structure on the basis of the user input for entity typology.

The rest of this brief provides an overview of the functionalities planned for the entity-level section of BECD, so that the data structure can be understood in the context of the uses and outputs that it will enable.

Database features

The entity-level section of BECD will support three main functionalities:

- Querying the database to generate typical carbon emissions values for a specific group of entities, based on a series of filters and search options. For example, users will be able to produce average, minimum, and maximum emissions (as $kgCO_2eq/m^2$) of residential entities arising in lifecycle module A. Through several filters, users will also be able to narrow down their selection, for example by including only project stages 0 to 3, and/or by including only entities which use steel columns as vertical structural elements.
- Recording users' own entities and related carbon assessments. This will be possible through different input modes, as explained below.
- Benchmarking users' own entities against typical carbon emissions values. Essentially, this will allow users to compare the carbon emissions of their entities against the results of a database query. The BECD system will automatically filter the results on the basis of the user's entity features (for example, by selecting the relevant entity typology), but the user will be able to adjust the filters manually.

These functionalities will enable different types of users to utilise the database according to their needs and interests. For example:

- **Building designers** can compare carbon emissions of their projects against projects which use the same types of technology and materials.
- **Carbon assessors** can keep records of their assessment and share the results with the industry.
- **Developers** can estimate carbon emissions of their development at preliminary design stages, based on typical emissions value for similar developments.
- **Policymakers** can generate benchmarks for specific building and infrastructure typologies to help establish suitable policy targets.

WG1 is planning a series of features for the entity-level section of BECD, with the intention to make it easy to operate and ensure its outputs are reliable and useful:

- Data validation: although BECD is not meant to provide an independent verification of carbon assessments, the system will be designed to scan project data entered by users to flag outliers and unusual values. Database administrators will be able to check project data and notes, and contact the users for further clarification.
- Data confidence score: each carbon assessment will be attributed a confidence score based on several variables, such as project stage, type of product data used, and presence of material quantities data. This score is meant to give users an indication of the level of accuracy and reliability of the assessment, and users will be able to filter out data associated with low scores when querying the database.
- Data input modes: different modes will be available to enter project data:
  - Manual online: users will manually complete an online form.
  - Manual via spreadsheet: users will be able to download a spreadsheet, complete it offline and upload it on BECD to automatically populate the online form.
  - External file upload: users will be able to take an existing file (in most cases a spreadsheet) that they have used to report their carbon assessment to a third party (for example to the Greater London Authority to obtain planning permission) and upload it on BECD. The BECD system will recognise the relevant data, automatically populate the online form, and ask users to input manually only the additional information that is not included in the original file.

- o API with external software: users will be able to feed project data into BECD through API directly from their building carbon/LCA software (e.g. OneClickLCA). The BECD system will recognise the relevant data, and ask users to input manually only the additional information.
- Benchmarking against industry and policy targets: users will be able to see how carbon emissions of their own entities (or a selected group of entities) compare to relevant industry and policy targets, such as LETI targets or CRREM trajectories.
- Comparing specific entities: users will be able to select two entities (and the relative project stages) and compare their carbon emissions in detail.
- Sharing entities between BECD users: the owner of an entity will be able to allow specific users to input data for that entity.
- Comparison across project stages: users will be able to compare how carbon emissions (and other variables) of an entity have changed from early stages to later stages of design and construction.
- Data export: users will be able to export their project data and the results of database queries in XLS and PDF formats.
- Conversion into ICMS3 format: users will be able convert and export information of their own entities into a structure aligned with the ICMS3 reporting format.