

Guide to the CO₂ impact template

Overview

The University Council have asked that carbon impact of capital projects be included as part of the business case when it is submitted for committee approval. A spreadsheet has therefore been devised in order to ensure this is reported in a consistent and transparent way.

The spreadsheet template generates a 'business as usual' figure for CO₂ emissions and compares this with predicted CO₂ emissions for the proposed project. CO₂ calculations for the project proposal include both the CO₂ emissions embodied in the construction process (scope 3 emissions), and the CO₂ emitted during operation (scope 1 and 2 emissions).

A 30-year timeframe is used for the CO₂ impact template for a number of reasons. It allows projects to demonstrate that operational emissions savings will more than outweigh any initial embodied CO₂ emissions. It prevents discounting of embodied CO₂ emissions beyond the point at which major further building work is often necessary e.g. reroofing, window renewal, functional change. 30 years also means the predicted decarbonisation of the electrical grid is fully accounted for, encouraging switching away from fossil natural gas.

Data inputs

The spreadsheet requires the following inputs:

- Floor areas of space proposed to be relinquished, refurbished and/or constructed
- Energy consumption for business as usual
- Predicted energy consumption for the proposals
- Predicted on-site renewable energy generation associated with the proposals
- Average carbon factor for the electrical grid over the next 30 years
- Predicted CO₂ emissions embodied in the construction process
- CO₂ released as a consequence of demolition / strip out of timber components
- CO₂ sequestered as a consequence of the new build elements of the project
- Change in travel related CO₂ emissions (only applicable if relocation will change travel patterns)

A line is also included to address the potential need to implement additional measures (onsite or offsite) to mitigate emissions generated by the project. For example, a project involving an expansion in floor area or energy consuming research will cause an increase in CO₂ emissions unless coupled with measures that reduce emissions elsewhere. Suitable mitigation measures may include retrofitting existing space, updating of inefficient equipment, or forming a heat network with neighbours.

Assumptions

Grid electricity carbon factor is based on the [UK Government projections](#) for the electrical grid with an adjustment factor to align with government conversion factors for annual reporting.

Measurement of CO₂ emissions embodied in the construction process is aligned with the minimum standards defined in the RICS guide '[Whole Life Carbon Assessment for the Built Environment](#)'. This assesses CO₂ emissions from cradle to project completion (so excludes maintenance, repair and end of life emissions). Structure, building envelope, internal partitions and doors and external works are assessed; however finishes, furniture/fittings/equipment and building services are excluded.

In the absence of a generally recognised standard for CO₂ sequestration measurement it is assumed that all timber will be harvested from sustainable sources and sequestration will take place as the replacement saplings gradually take up carbon. A rate of 50% of the actual material carbon content is used as a rough proxy.

If a project involves a relocation of staff that is likely to impact on modes of travel then the Sustainability Team will apply a bespoke analysis based on travel survey data, current carbon factors for travel modes, and a discount factor to reflect projected decarbonisation of the transport sector.

Approval gateways

For Project Registration and the Strategic Outline Business Case (inception and feasibility) the Estates Division [Sustainability Team](#) can assist in providing the necessary input figures using benchmark data. Ranges of uncertainty will be applied to the figures (at Strategic Outline Business Case this is typically +/- 30%

The University Design and Standards Brief requires designers to provide assessments of both embodied carbon and operational energy at concept design stage using industry standard methodologies. The CO₂ impact template should therefore be updated with these more accurate figures (typically +/-20%) for reporting as part of the Concept Business Case.

A further update is required from designers during the technical design stage. The CO₂ impact template should therefore be updated with these more accurate figures (typically +/-10%) for reporting as part of the Full Business Case.

Actual energy consumption will be reviewed post completion and it is expected that this will be reported to the wider University and compared with predictions to facilitate improved benchmarking.