Calculator: Life Cycle Carbon Calculator

http://www.ibec.or.jp/CASBEE/english/

Summary

The CASBEE Life Cycle Carbon Calculator (LCCO2) measures the emissions related to a development over its entire lifecycle including construction, operation, renewal, repair and demolition.

Developers: Japan GreenBuild Council (JaGBC) / Japan Sustainable Building Consortium (JSBC)

Applicable sectors							Themes		
All Infrastructure	Buildings	Roads	Water	Energy	Transport	Construction	Materials	Ecology	Wastewater
							Potable Water	Carbon/GHG	Other

Countries	Japan	**Access**	Free to download
Compatibility with other tools	This calculator is part of the excel-based CASBEE rating tool.	**Guidance for users**	The *CASBEE Technical Manual* (for the appropriate building typology) provides support. There is a section on the lifecycle CO2 calculation with detailed information on methodology, data and guidance.
Inputs & outputs	If the Standard Calculation is selected, the LCC02 is calculated automatically by the CASBEE software based on data provided by the user throughout the assessment as well as inbuilt data. If the Individual Calculation is selected, the user needs to provide substantial information related to construction, operation, repair, renewal and demolition. The output of the calculation is the sum of the total lifecycle CO2 emissions of the development (in kgCO2/m2/year). The result is displayed in a Global Warming Impact chart which shows the carbon footprint of each phase of the development as compared to the reference case, and the performance level of CASBEE awarded. I.e. for a lifecycle CO2 emission rate that is 125%, 100% or 75% of the reference value, the project is awarded level 1, 3 or 5 (max. performance) respectively.	**Methodology**	The calculator estimates the total amount of CO2 emissions produced by the building over its entire lifespan. This includes consideration of emissions during: i) construction (embodied CO2, quantities and environmental loads of materials, material recycling), ii) operation (primary energy consumption, use of renewables), iii) renewal, demolition and disposal (renewal intervals, repair rate, emissions at demolition). Due to the laborious nature of collecting such data, the CASBEE calculator offers two calculation options: the Standard Calculation and Individual Calculation. The former does not require additional data, rather it draws from assessment items relating to CO2 emissions which have already been evaluated for CASBEE. If a more accurate LCCO2 value is required, the user may use the Individual Calculation sheet to include their own data. The building performance is assessed by comparing its LCC02 with that of a Reference Building of Level 3 (average) performance on the CASBEE scale.
Database library	The calculator is based on extensive databases for each building typology including: - CO2 emissions related to construction for different structural frame materials (incl. recycled materials); - Emissions related to repair, renewal and demolition; - Emissions during operation (incl. emission factors published by different Japanese electric utilities, standard CO2 emissions by building typologies and energy sources).	**Data intensity**	Data intensity for the Standard Calculation is low as the calculation is based significantly on background data. The intensity increases significantly if a more accurate calculation of LCC02 is required and the Individual Calculation is used instead.