

# Building information modelling life cycle assessment

An introduction to IMPACT

Daniel Doran

**This Information Paper is for construction industry professionals who have an interest in assessing embodied impacts and want to know more about IMPACT and automated life cycle assessment (LCA) in building information modelling (BIM). This includes those involved in embodied impact consultancy, BRE Environmental Assessment Method (BREEAM) Assessors and BREEAM Accredited Professionals, environmentally aware designers and construction product manufacturers.**

**It begins by introducing embodied impacts and how they are measured using LCA. This is followed by a review of the key themes and advantages of building-level LCA, integration in BIM and BREEAM. After reading this Information Paper, readers will understand how BRE is approaching building-level LCA, and how it is implemented in BIM through IMPACT.**

## 1 Introduction

BRE has played a key role in assessing the environmental impact of construction for over 20 years. In this time, interest in assessing embodied environmental impacts has increased markedly. Construction professionals understand that improvements in resource efficiency are vital in a world of finite resources, and that impacts from buildings extend well beyond the operational energy of heating, cooling and power. Although life cycle assessment (LCA) is recognised as the best way to quantify these impacts, the profusion of standards, methodologies, data sources and tools can be bewildering to non-experts.

The construction industry has also begun gearing up for the adoption of building information modelling (BIM), where 3D geometry and other types of information are combined into a single, integrated model.

The combination of these factors has paved the way for BRE and three other partners to produce IMPACT. IMPACT is not a single software application; it is a method for consistent and robust building level LCA and life cycle costing for incorporation into

a wide range of design tools. The first IMPACT Compliant tool by Integrated Environmental Solutions Ltd (IES) was released in 2013. For more information on the IMPACT project, see Box 1.

### Box 1: The IMPACT project

The IMPACT project is led by BRE, in partnership with Integrated Environmental Solutions Ltd (IES), WD Rethinking Ltd and AEC3 (UK) Ltd. The project is officially supported by the Construction Products Association, Faithful+Gould, RIBA and NBS. IMPACT received funding from the Technology Strategy Board and was arranged into two phases:

- Phase 1: Development of the IMPACT method, data and production of the first IMPACT Compliant tool (by IES).
- Phase 2: Production of a specification of the IMPACT method to facilitate further implementations of IMPACT by other software developers.

IMPACT Compliant tools offer both LCA and life cycle costing analysis functionality and are intended for construction industry professionals including architects, specifiers, engineers, quantity surveyors, constructors and specialist environmental consultants.

