

# Life-cycle assessment-based tool for civil infrastructure projects



Initially developed in the late 1960s and early 1970s, Life-Cycle Assessment (LCA) has become a recognised and valued tool for the assessment of environmental impacts, and especially for major projects. Most assessments are carried out using dedicated software packages by expert practitioners and it remains a relatively specialist field. LCA is most commonly used for ‘Cradle to Grave’ assessment, but partial stages of the life cycle can also be studied in isolation. Procedures of LCA are harmonised in the ISO14040 series, which itself sits within the widely applied ISO14000 series of environmental management standards.

**T**he use of LCA in the selection and specification of building materials is becoming more widespread in building construction owing to the growing popularity of the Building Research Establishment Environmental Assessment Method (BREEAM) and its use of the Environmental Profiles Methodology through the Green Guide to Specification. The success is due to general market uptake and through the integration of the concepts and methodologies into policy frameworks such as the Code for Sustainable Homes (CSH).

Such developments in civil infrastructure have been far slower in their uptake, even though the CEEQUAL Scheme for environmental assessment of civil engineering and public realm projects includes questions that promote the benefits of life-cycle environmental assessments of infrastructure projects.

To further the agenda Aggregate Industries, Loughborough University and BRE are collaborating on a joint Engineering Doctorate (EngD) research project. The work is being lead by Shamir Ghumra with the aim of refining existing LCA methods and datasets to the needs arising in infrastructure projects. The final outcomes may include a database and dissemination platform for environmental im-



Road re-surfacing project in Northall, Buckinghamshire

portant information for the civil engineering sector and, potentially, a green guide to civil engineering specification.

A wide range of research methodologies will be employed in the course of the programme including:

- communicating with stakeholders and other associated organisations;
- application of the Environmental Profiles Methodology and database to civil infrastructure scenarios;
- development of the concept for new tools specific to civil infrastructure;
- forging links and cooperation with existing market tools and methods such as CEEQUAL.

From the research programme it is hoped that the industry will benefit from the availability of a comprehensive and independent LCA platform on the embodied environmental impact of specifications and materials used in civil infrastructure.

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