

ENVIRONMENTAL IMPACT OF VERTICAL CLADDING

Daniel Doran and Jane Anderson



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ENVIRONMENTAL IMPACT OF VERTICAL CLADDING

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GLOSSARY

Allocation: sharing the input or output flows of a unit process to the product system under study. This may need to be done where a manufacturing process results in products and co-products, for example, steel and slag.

Ecopoints: (as used in the BRE Environmental Profiles Methodology) the normalised profile values are multiplied by weighting factors developed for each impact category and the results are summed to give a single value.

Environmental impact category: environmental issue being examined, eg climate change, acid deposition and human toxicity to air.

Environmental profile: the level of impact in each environmental impact category for the functional unit or product being studied.

Functional unit: a qualitative description of function specifically defined for the product/service under study and any alternative products/services to which it is compared. The use of a functional unit means that the alternative designs under study are, in theory, compared fairly. For example, a comparison of external walls may be based on every external wall design in the study achieving a U-value of 0.3 W/m²K and compliance with building regulations.

Input: material or energy that enters a unit process (can include raw materials and intermediate products).

Intermediate products: material that has already been processed before being used to produce a product.

Life cycle: consecutive and interlinked stages of a product system from raw material acquisition or generation of natural resources to the final disposal.

Life cycle assessment (LCA): compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.

Normalised profile: the characterised profile is referenced to the environmental impact for each category at the national or global level in one year (usually for one citizen), giving a 'normalised' profile; the values are directly comparable.

Output: material or energy that leaves a unit process (may include raw materials, intermediate products, products, emissions and waste).

Raw materials: unprocessed material that is used to produce a product.

1 INTRODUCTION

The cladding sector accounts for a substantial proportion of external wall construction, both in the UK and internationally. For certain building types the range of choice, flexibility and speed of installation are all factors that contribute to the decision to use cladding solutions.

However, with such a wide variety of choice within the sector, what are the environmental considerations? To answer this question, this report draws together the relevant information, data and experience gained during the production of *The Green Guide to Specification*^[1] (*The Green Guide*) and utilised in the assessment of cladding specifications.

‘Cladding’ is a broad category where the analysis of environmental impact is concerned because of the vast range of materials used. For this reason, the scope of this paper (in terms of types of cladding covered) is limited to the external wall cladding types assessed in *The Green Guide*. In addition, due to the diverse nature of cladding and the abundance of terms used to describe it, terms relevant to *The Green Guide* are defined in the Appendix at the end of this report.

This report has been produced as part of a series on the environmental impact of materials relating to *The Green Guide*. Many of the other reports in the series focus on specific materials, and will provide more in-depth information, which may also be of value when considering the environmental impact of specific cladding types.

1.1 LIFE CYCLE ASSESSMENT, ENVIRONMENTAL PROFILES AND THE GREEN GUIDE

In 1999, with financial support from the UK Government and the support of the construction products sector, BRE launched the Environmental Profiles scheme. The scheme covers the Life Cycle Assessment (LCA) methodology for construction products (known as Environmental Profiles), and includes LCA data for over 80% (by mass) of UK construction materials provided by industry and assessed by BRE.

These data have been used to inform the manufacturers of construction materials, through post-assessment Environmental Profile reports, by showing the source of their impacts, and the wider construction industry through *The Green Guide to Specification*, the BRE Environmental Assessment Method (BREEAM, www.breem.org) and the Code for Sustainable Homes^[2].

In 2002, a certification scheme was introduced to allow individual manufacturers to highlight the environmental performance of their products. Currently around 50 manufacturers have obtained Certified Environmental Profiles^[3] for a wide range of products.

In 2004, with support from the BRE Trust, a major update of the underlying LCA methodology was undertaken, reviewing assessment methods, normalization and weighting, and most aspects of methodology. For example, data selection, waste assessment and energy use, were reviewed through an extensive stakeholder consultation, peer review and new data collection project. This drew to a close with the release of the updated BRE Environmental Profiles methodology in 2007^[4], the launch of *The Green Guide* online (www.bre.co.uk/greenguide) in June 2008 and the publication of *The Green Guide to Specification* 4th edition in 2009^[1].



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ENVIRONMENTAL IMPACT OF VERTICAL CLADDING

This report reviews how external wall cladding materials have been assessed within *The Green Guide to Specification*, including the application of the Environmental Profiles methodology which underlies *The Green Guide* data. The way in which cladding is addressed within building-level environmental assessment schemes such as BREEAM and the Code for Sustainable Homes is also explained.

The report will give manufacturers and specifiers a general understanding of the significant benefits and impacts of external wall cladding products over their whole life cycle and help to identify opportunities for improvements to their environmental performance.

It is part of a series that provides comparable information on cladding, floor finishes, insulation, masonry and concrete, metals, timber and windows to assess the environmental impact of specific construction materials.

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